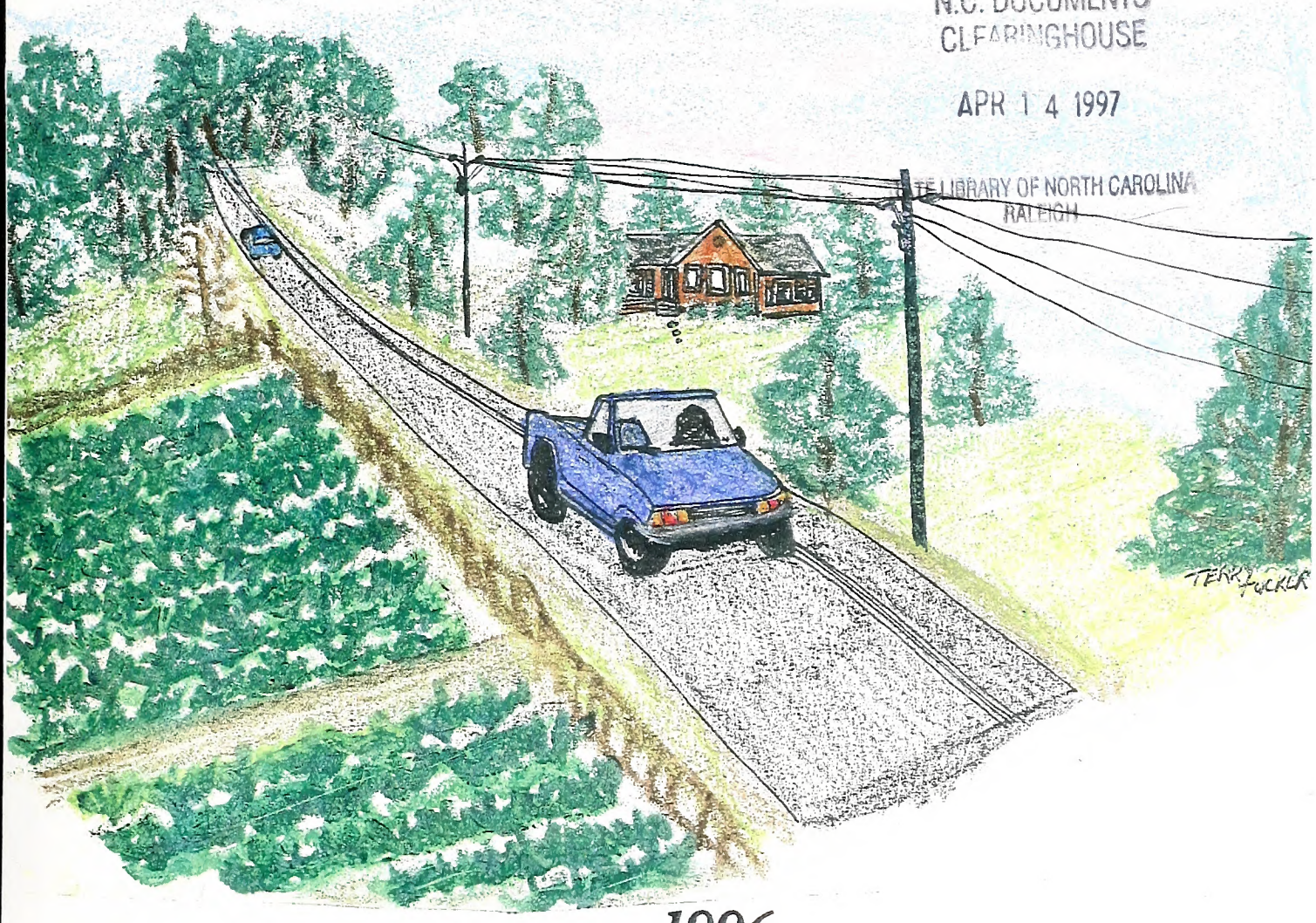
North Carolina Department of Transportation
Division of Highways
Statewide Planning Branch

THOROUGHFARE PLAN FOR THE CITY OF CLINTON



1996

THOROUGHFARE PLAN
FOR THE
CITY OF CLINTON

Prepared by the:

Statewide Planning Branch
Division of Highways
N. C. Department of Transportation

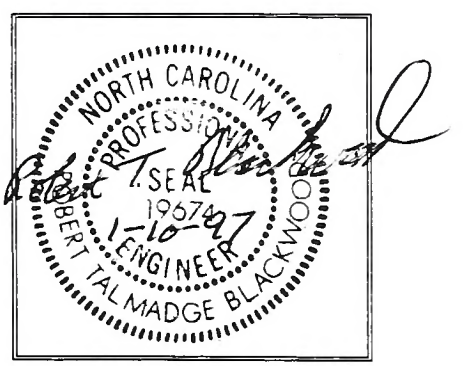
In cooperation with:

The City of Clinton
The Federal Highway Administration
U. S. Department of Transportation

December, 1996

Persons responsible for this report:

Project Engineer:	M. A. Freeman
Systems Planning Engineer:	R. T. Blackwood, P.E.
Statewide Planning Branch Manager:	M. R. Poole, Ph.D., P.E.
Engineering Technicians:	B. Stewart
	T. Tucker



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1. INTRODUCTION

This report documents the process of developing the Clinton Urban Area Thoroughfare Plan. As conditions continually change, it is necessary to update thoroughfare plans. This plan, when adopted, will replace the 1980 Thoroughfare Plan.

A well planned transportation system is an asset to the economic and social well being of a growing community. It provides the means to transport people and goods from one place to another quickly and conveniently. A good highway system must not only meet existing travel demands, but must also keep pace with the development of the region. This report will set a system of major roads and highways required to satisfy the anticipated needs of the Clinton area for the next twenty five years. Certain priorities shall be established in the development of the thoroughfare system. These priorities will be based on maintenance needs, bridge inadequacies, poor alignments, and insufficient present and future roadway capacities.

The proposed Clinton Thoroughfare Plan was developed following the basic principles of thoroughfare planning as described in **Chapter 10** of this report. The plan recommends those improvements that are felt to be essential for proper traffic circulation within the 1995-2020 planning period.

Most of the proposed improvements will be the responsibility of the North Carolina Department of Transportation. However, Clinton can provide assistance in the implementation of the plan through subdivision regulations and zoning ordinances. It is desirable that the plan be formally adopted by both the City of Clinton and the North Carolina Department of Transportation to serve as the official guide in providing a well coordinated, adequate, and economical major thoroughfare system.

It should be emphasized that the recommended plan is based on anticipated growth of the area as indicated by current trends. Design requirements and exact project locations should be based on detailed studies of each project on an individual basis.

Information in this report was based on current knowledge of projects in the area. When the plan was developed, a location for the NC 24 Bypass had not been chosen. This report assumes that the NC 24 Bypass will be constructed within the planning period. Any project that could be affected by a bypass of the Clinton area should be studied closely, taking into account the completion date of the bypass, as well as its exact location.

A few improvements suggested in the 1980 plan have been completed. The section of Sampson Street (SR 1854) from McKoy Street (SR 1839) to Johnson Street (SR 1137) was listed as a dirt road in the 1980 plan. The section has since been paved.

Peterson Street (SR 1219) from Carter Street to McKoy Street was also listed as a dirt road, and is now paved. The 1980 plan recommended a connection from Elizabeth Street (SR 1214) to Sampson Street. This connection was partially complete when this report was prepared.

The 1980 plan replaced the first plan developed for Clinton. This plan was developed in 1965 by the Advance Planning Department of the North Carolina State Highway Commission. Projects from the first plan completed before the 1980 plan was developed include the extension of John Street to Eastover Avenue, the implementation of US 701 Business, the widening of NC 24 West, the widening of Chestnutt Street, and the construction of the US 421-NC 701 Bypass.

2. THOROUGHFARE PLAN

A thoroughfare plan study uncovers the need for new facilities, plus identifies existing and future deficiencies in the transportation system. The thoroughfare plan is a representation of the existing highway system by functional use, e.g.; major thoroughfares, minor thoroughfares, plus any new facilities that are needed. The planning methodology enables identification of deficiencies in the existing system, allowing compilation of a list of needed improvements.

This chapter presents an analysis and makes recommendations based on the ability of the existing street system to serve present and future travel desires as the area continues to grow. The usefulness of transportation planning is in the analysis of different highway configurations for their efficiency in serving the area. The recommended plan sets forth a system of thoroughfares to serve the anticipated traffic and land development needs for the Clinton area. The need to eliminate existing and projected system deficiencies that cause traffic congestion is the primary objective of the plan.

The thoroughfare plan outlines the transportation system network according to each roadway's function within the system. Each road in the thoroughfare plan was evaluated based on the following factors: alignment, capacity, width, number of lanes, projected 2020 traffic volume, existing and future land use patterns, environmental impacts, and pavement structure. Suggestions for the improvement of roads are made based on these factors. Also, aerial photography, topographic mapping, field reconnaissance, and discussions with local staff, officials, and local citizens provided additional basis for identifying and evaluating alternate alignments. The recommended thoroughfare plan for Clinton is shown in figure **2-A** and detailed in appendix **A**. Please note that the terms ultimate and ultimately are used to describe improvements that may not be needed within the planning period, but soon after could be necessary. They are included in this report for the purpose of information and future planning.

Elements of the Clinton Thoroughfare Plan are as follows:

MAJOR THOROUGHFARE SYSTEM

Freeway System

A freeway is a divided, controlled access facility. Its purpose is to provide uninterrupted flow for traffic. The following is the only freeway in the planning area.

US 701 Bypass

Freeway Recommendations

The capacity of the section of US 701 Bypass that passes through the Clinton planning area is greater than the 2020 projected traffic for this section. Therefore, this report makes no recommendations for US 701 Bypass.

Other Major Thoroughfares

Other major thoroughfares serve as the primary movers of traffic in the urban area. The following is a list of major thoroughfares.

US 421
US 701 Business
NC 24
NC 403
Beamon St. (SR 1838)
Beulah Rd. (SR 1222)
Butler St. (SR 1227)
College St. (SR 1856)
Dixon St. (SR 1749)
Elizabeth St. (SR 1214)
Ferrell St. (SR 1281)
Governor Moore Rd. (SR 1752)
H B Lewis Rd. (SR 1751)
Indian Town Rd. (SR 1226)
Isaac Weeks Rd. (SR 1829)
Lisbon St. (SR 1231)
Matthis Rd. (SR 1918)
McKoy St. (SR 1839)
Morisey Blvd. (SR 1275)
North Blvd. (SR 1311)
Old Warsaw Rd. (SR 1919)
Overland Rd. (SR 1229)
Pugh St. (SR 1751)
Raleigh Rd. (SR 1753)
Reedsford Rd. (SR 1932)
Rowan Rd. (SR 1924)

Sampson St. (SR 1854)
South Blvd.
Southwest Blvd. (SR 1276)
Sunset St. (SR 1296)
Tram Rd. (SR 1227)
Vance St.
Warsaw St. (SR 1855)

Major Thoroughfare Recommendations

US 421 - From Industrial Boulevard to Browns Church Road (SR 1842). To handle the anticipated traffic, this section should be widened to a 4 lane facility (see cross-section F). This should be modified to a five lane section when turning traffic warrants.

US 701 Business - From Dixon Street (SR 1749) to the northern planning boundary. This section should be widened to a five lane curb and gutter section (see cross-section C) to handle the expected traffic and give access to the strip development in this area. Also, from SW Boulevard to Rowan Street (SR 1924) should be widened to five lanes.

NC 24 - From Airport Road (SR 1262) to the eastern planning boundary. This section should be widened to five lanes (see cross-section C) due to capacity needs. Past Coharie Drive, this can be modified to a four lane section (see cross-section F). From US 701 Business to the eastern planning boundary. This entire section should be widened to four lanes to accommodate the anticipated volume of traffic (see cross-section E).

Beamon Street (SR 1838) - From US 701 Business to Balsey Street. This section should be widened to 44 feet due to capacity needs. The addition of turn lanes in and out of the hospital would be beneficial. From College Street (SR 1856) to Morisey Boulevard (Eastover St). This section will not be over capacity within the planning horizon; however, it has been identified as a future problem. The right of way should be preserved to allow an ultimate 44 foot wide section to be constructed in the future.

Beulah Street (SR 1222) - The section of this road in the planning area should be widened to 20 feet to meet DOT safety requirements.

College Street (SR 1856) - From Devane Street (SR 1280) to Vance Street. This section should be widened to 36 feet to meet capacity needs.

Dixon Street (SR 1749) - The section of Dixon Street within the planning boundary should be widened to 22 feet to meet DOT safety requirements.

Elizabeth Street (SR 1214) - From the southern planning boundary to Indian Town Road (SR 1226). This section should be widened to 24 feet. From Indian Town Road to Morisey Street (SR 1275). This section will not exceed capacity within the planning horizon. However, it has been identified as a future need. This section should be protected to provide for an ultimate width of 48 feet . In addition, a 24 foot wide connector should be constructed from Elizabeth Street (SR 1214) at Lisbon Street (SR 1231) to Sampson Street (SR 1854), and from Elizabeth Street at Lisbon Street to College Street (SR 1856) (see Thoroughfare Plan map for location).

Governor Moore Road (SR 1752) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

H B Lewis Road (SR 1751) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Indian Town Road (SR 1226) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Isaac Weeks Road (SR 1829) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Matthis Road (SR 1918) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Morisey Boulevard (SR 1275) - From Elizabeth Street (SR 1214) to Stetson Street. This section should be widened to 24 feet to meet capacity needs and safety requirements.

Old Warsaw Road (SR 1919) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Outer Loop - See the Thoroughfare Plan map (figure **2-A**) for location. New construction of a 24 foot roadway on 70 Right-of-way (see cross-section K) recommended.

Overland Road (SR 1229) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Pugh Street (SR 1751) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Raleigh Road (SR 1753) - From US 701 Business to Pugh Street (SR 1751). An ultimate cross-section of 32 feet is recommended for this road.

Reedsford Road (SR 1932) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Sampson Street (SR 1854) - From Boney Street to McKoy Street (SR 1839). This section of road should be widened to 20 feet to meet DOT safety standards.

South Boulevard (NC 24) - From US 701 Bypass to US 701 Business. This section will ultimately require a four lane cross-section (see cross-section F). The location of the NC 24 Bypass will determine the need of this recommendation. The further the NC 24 Bypass is built from Clinton, the less traffic it will remove from South Boulevard.

Minor Thoroughfare System

Minor thoroughfares serve local traffic within the urban area. The following is a list of minor thoroughfares.

Airport Rd. (SR 1262)
Barrus St.
Brown Church Rd. (SR 1842)
Byrd Yanceybass Rd. (SR 1934)
Carter St.
Fayetteville St. (SR 1855)
Herring St.
Industrial Blvd.
John St.
Johnson Rd. (SR 1137)
Loop St.
Peterson Rd. (SR 1219)
Rackey Rd. (SR 1922)
Railroad St. (SR 1232)
Stewart St.
Wall St.
West Main St.
Westover St. (SR 1289)
Williams St.
Woodland Dr.

Minor Thoroughfare Recommendations

Airport Road (SR 1262) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Barrus Street - A 24 foot wide section should ultimately be constructed from Barrus Street to John Street.

Brown Church Road (SR 1842) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Byrd Yanceybass Road (SR 1934) - The section of this road within the planning boundary should be widened to 20 feet to meet DOT safety standards.

Peterson Road (SR 1219) - The section of this road within the planning boundary should be widened to 24 feet for capacity and safety reasons.

Rackey Road (SR 1922) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Railroad Street (SR 1232) - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

Stewart Street - The section of this road within the planning boundary should be widened to 22 feet to meet DOT safety standards.

West Main Street - From Chestnut Street to NC 24. This section should be widened to 24 feet (cross-section K) to meet DOT safety standards.

RECOMMENDED PRIORITY
FOR UNPROGRAMED PROJECTS

First Priority

1. Elizabeth Street Extension - From Lisbon Street to Sampson Street, and from Lisbon Street to College Street.
2. NC 24 Widening - From Airport Road to Clinton's Western Planning Limit.
3. NC 24 Widening - From current four lane section east of Southeast Boulevard to Clinton's Eastern Planning Limit.
4. Outer Loop Section 1 - From NC 24 to US 421.

Second Priority

1. US 421 Widening - From Industrial Boulevard to Clinton's Northern Planning Limit.
2. Butler Street Extension - From Kennedy Street to Eastover Avenue.
3. Outer Loop Section 3 - From Reedsford Road to Pugh Road
4. Outer Loop Section 2 - From West Main Street to Indiantown Road.

Third Priority

1. Loop Street - From McKoy Street to Elizabeth Street.
2. US 701 Widening - From Dixon Street to Clinton's Northern Planning Limit.
3. Outer Loop Section 4 - From Gov. Moore Road to Industrial Boulevard.
4. Peterson Street Extension - From current eastern end to Beamon Street and from McKoy Street to Barden Street.

FIGURE 2A

CLINTON THOROUGHFARE PLAN

ADOPTED BY:

CLINTON _____ JULY 2, 1996

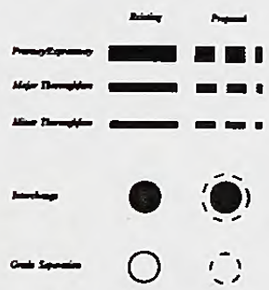
RECOMMENDED BY: M. R. Poole

STATEWIDE PLANNING JULY 15, 1996

N. C. DEPT OF TRANSPORTION AUGUST 2, 1996

PUBLIC HEARING DATE JULY 2, 1996

LEGEND



MAP DATE
JUNE 11, 1996

CLINTON

Sampson County
North Carolina

PREPARED BY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Division of Highways Statewide Planning Branch
In cooperation with the
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 5 6 7
1000 FEET

0 1 2
1000 METERS

3. IMPLEMENTATION

There are several methods through which a local government may implement a Thoroughfare Plan. Suggested implementation methods for the projects in the Clinton Thoroughfare Plan are listed below and are summarized in Table **3-1.** The remainder of this chapter describes the various methods.

Clinton Thoroughfare Plan: Suggested Project Implementation

The following text lists each of the recommended projects, their estimated cost, and a recommended method of implementation. The recommendations of this chapter are summarized in Table **3-1**. In addition, a cost benefit comparison is provided in Table **3-2**. For all projects, it is recommended that the City use its local subdivision regulations and zoning ordinances in conjunction with the Thoroughfare Plan to preserve corridors and prevent encroachment of development that could prevent, or increase the cost of, construction.

1. Clinton Outer Loop - Estimated cost $23,900,000 ($22,100,000 construction, $1,800,000 Right-of-Way). This project is recommended to relieve downtown congestion. The loop will allow cross town travel without entering the downtown area. The TIP (Transportation Improvement Program) process should be employed to fund this project. Also, Industrial Access funds may be used to finance this project. Clinton should use its zoning and subdivision ordinances, as well as the development review process to reserve the corridor for this project. Note: cost is for total project, loop is intended to be constructed in sections.

2. Butler Street Extension - Estimated Cost $670,000 ($540,000 construction, $130,000 Right-of-Way). This provides a North - South connection for the Outer Loop, allowing traffic to cross town without the use of the downtown area. It also connects several developed areas to the Loop. Local funds, and possibly TIP funds could be employed to finance this project. The City should use its zoning and subdivision ordinances as well as the development review process to preserve this corridor. As the construction date nears, the City might consider a Future Street Lines Map to assure control of the corridor.

3. Elizabeth Street Extension - Estimated Cost $340,000 ($220,000 construction, $120,000 Right-of-Way). This connection runs from Elizabeth Street to Sampson Street, and from Elizabeth Street to College Street. This improves traffic circulation in Downtown Clinton. The

project should be financed through local funds. The City should use its zoning ordinances as well as the development review process to preserve this corridor. As the construction date nears, the City might consider a Future Street Lines Map to assure control of the corridor.

4. Loop Street - Estimated Cost $ 700,000 ($370,000 construction, $330,000 Right-of-Way). Included in the 1980 plan, one section of Loop Street is already complete. Completion of the remaining sections should ease traffic around the Downtown Circle area.

5. Peterson Street - Estimated Cost $ 700,000 ($370,000 construction, $330,000 Right-of-Way). This connection creates a more direct route from the residential areas around Sampson and McKoy Streets to the commercial area on US 701 Business. The City should use its zoning and subdivision ordinances as well as the development review process to preserve this corridor. Local funds should be employed for this project.

Implementation Methods
State-Municipal Adoption of the Thoroughfare Plan

Both the City of Clinton and the North Carolina Department of Transportation have responsibility for implementation of the Clinton Thoroughfare Plan. Chapter 136, Article 3A, Section 136-66.2 of the North Carolina General Statutes provides that after development of a Thoroughfare Plan, the plan may be adopted by the governing body of the municipality and the Board of Transportation as the basis for future street and highway improvements. After mutual adoption, negotiations will begin to determine which of the existing and proposed thoroughfares will be a Department of Transportation responsibility and which will be a municipal responsibility. Facilities which are designated as State responsibility will be constructed and maintained by the Division of Highways; however, the municipality may share in the right-of-way cost. This share of costs will be determined at the time of construction.

In general, the State is responsible for those facilities which will be serving major volumes of through traffic and traffic from outside the area to major commercial, industrial, and institutional areas inside the municipality. Those facilities which will serve primarily internal traffic are to be a municipal responsibility.

Administrative controls and implementation methods that can aid in the implementation process are generally available to municipalities through Federal and State legislation. These controls and methods include, but are not limited to: subdivision

regulations, zoning ordinances, official maps, urban renewal, capital improvements programs, and development reviews. Generally, two issues play a major role in the implementation process; available finances and citizen involvement. Effective use of the controls and methods listed above are indicative of good planning and minimize the effect of limited finances and negative citizen reaction to specific elements of the plan. It is through good planning that maximum use is made of every available dollar and that citizen involvement and approval of the Thoroughfare Plan is obtained.

Subdivision Regulations

Subdivision regulations require every subdivider to submit to the local planning commission a plan of his proposed subdivision and requires that the subdivision be constructed to certain standards. Through this process, it is possible to require the subdivision streets to conform to the Thoroughfare Plan and to reserve or protect necessary rights-of-way for projected roads and highways that are to become a part of the Thoroughfare Plan. The construction of subdivision streets to adequate standards would reduce maintenance costs and would facilitate the transfer of the streets to the State Highway System. Appendix B outlines the recommended design standards.

Roadway Corridor Official Map

North Carolina General Statutes 136-44.50 through 133-44.53 are collectively designated as the "Roadway Corridor Official Map Act." For cities contemplating the adoption of a Roadway Corridor Map, more commonly referred to as an Official Street Map, there are several things to consider prior to implementation. First and foremost, it should be recognized that an Official Street Map places severe, but temporary, restrictions on private property rights. These restrictions are in the form of a prohibition, for a period of up to three years, for the issuance of building permits or subdivision of property lying within an Official Street Map corridor. This authority should be used carefully and only in cases where less restrictive powers will be ineffective.

The Statute establishing the Official Street Map authority is fairly explicit in outlining the procedures to be followed and the types of projects to be considered. As required by the Statute, a project being considered for an Official Street Map must be programed in the State's Transportation Improvement Program (TIP) **or** included in a locally adopted capital improvement plan, in addition to appearing on the adopted street system plan. The Statute states that the capital improvement plan must be for a period of ten years or less, and must identify the estimated cost of acquisition and construction of the proposed project as well as the anticipated financing.

The Program and Policy Branch of the North Carolina Department of Transportation is responsible for facilitating the adoption of Official Street Maps. Cities considering Official Street Map projects should contact the Program Development Branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Maps" at:

Program Development Branch
NC Department of Transportation
P.O. Box 25201
Raleigh, NC 27611

Zoning

A zoning ordinance can be beneficial to thoroughfare planning in that planned locations of various land uses and planned densities of dwellings can be realized. This provides a degree of stability on which to make future traffic projections and to plan streets and highways.

Other benefits of a good zoning ordinance are: **(1)** the establishment of standards of development which will aid traffic operations on major thoroughfares, and **(2)** minimizing strip commercial development which creates traffic friction and increases the traffic accident potential.

Urban Renewal

Urban renewal is defined as the rehabilitation of downtown areas by demolishing, remodeling, or repairing existing structures in accordance with comprehensive plans. This process allows for corrections to basic problems in the street system layout and design.

To qualify for community development funds or discretionary funds for urban renewal, a city must first prepare a community development program. Urban areas compete throughout the State on the basis of demographic points which consider such conditions as percent of substandard housing, people per square feet of housing, dwelling unit age, etc. An effort can be made to ensure that community development and transportation plans are compatible.

Capital Improvements Program

One of the tools which makes it easier to build a planned thoroughfare system is a Capital Improvements Program. This is a long range plan for the spending of money on street improvements, acquisition of right-of-way, and other capital improvements within the bounds of projected revenues. Municipal funds should be available for construction of street improvements which are a

municipal responsibility, right-of-way cost sharing on facilities designated as Division of Highways responsibility, and advance purchase of right-of-way where such action is required.

The section of the Capital Improvements Program which deals with the Thoroughfare Plan requires a fairly detailed knowledge of the costs of various projects. This program could be used to benefit any of the improvements listed in this plan.

Development Reviews

Driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and by the Traffic Engineering Branch of the North Carolina Department of Transportation prior to access being allowed. Any development expected to generate large volumes (i.e. shopping centers, fast food restaurants, large industries, etc.) may be comprehensively studied by staff from the Traffic Engineering, Statewide Planning, and Roadway Design Branches of NC DOT. If done at an early stage, it is often possible to significantly improve the development's accessibility at minimal expense. Since the municipality is the first point of contact for developers, it is important that the municipality advise them of this review requirement and cooperate in the review process.

Other Funding Sources

1. Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are to be based upon "reasonable and uniform considerations of capital costs to be incurred by the city as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process."

2. Enact a bond issue to fund street improvements.

3. Have project included in the North Carolina Transportation Improvement Program (TIP). North Carolina's TIP is a document which lists all major construction projects the Department of Transportation plans for the next seven years. Similar to local Capital Improvement Program Projects, TIP projects are matched with projected funding sources. Each year when the TIP is updated, completed projects are removed, programed projects are advanced, and new projects are added.

During annual TIP public hearings, municipalities request projects to be included in the TIP. A Board of Transportation member, Division Engineer, and DOT Staff review all of the project request in a particular area of the State. Based on the technical feasibility, need, and available funding, it is decided which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are available for bridge replacement projects, highway safety projects, public transit projects, railroad projects, and bicycle projects.

4. Consider the possibility of specific projects qualifying for federal demonstration project funds.

5. Adopt a collector street plan that would assess buyer or property owners for street improvements.

6. Charge a special assessment for utilities; for example, increase water and sewer bills to cover cost of street improvements.

7. Industrial Access Funds. If an industry wishes to develop property that does not have access to a state maintained highway and certain economic conditions are met, then funds may be made available for construction of an access road.

8. Small Urban Funds. Small Urban funds are annual discretionary funds made to municipalities with qualifying projects. The maximum amount is $300,000 per year per project. A city may have multiple projects. Requests for Small Urban Fund assistance should be directed to the appropriate Board of Transportation member and Division Engineer.

TABLE 3-1

FUNDING SOURCES & METHODS OF IMPLEMENTATIOM									
SECTION	Funding Sources				Implementation Methods				
	Local Funds	TIP Funds	Indust. Access	Small Urban	T-fare Plan	Subdiv Ord.	Zoning Ord.	Future Street Lines	Develop. Review
OUTER LOOP - SECT 1		X	X		X	X	X		X
OUTER LOOP - SECT 2		X			X	X	X		X
OUTER LOOP - SECT 3		X			X	X	X		X
OUTER LOOP - SECT 4		X			X	X	X		X
NC 24: AIRPORT - WPL	X	X			X		X		X
US 701: DIXON - NPL	X	X			X		X		X
US 421: INDUSTRIAL - NPL	X	X			X				
WOODLAND EXT.	X				X	X	X		X
BUTLER EXT.	X				X		X	X	X
ELIZABETH EXT.	X				X		X		
SAMPSON EXT.	X				X		X		
LOOP ST McKOY - ELIZABETH	X				X		X	X	
PETERSON ST	X				X	X	X		X

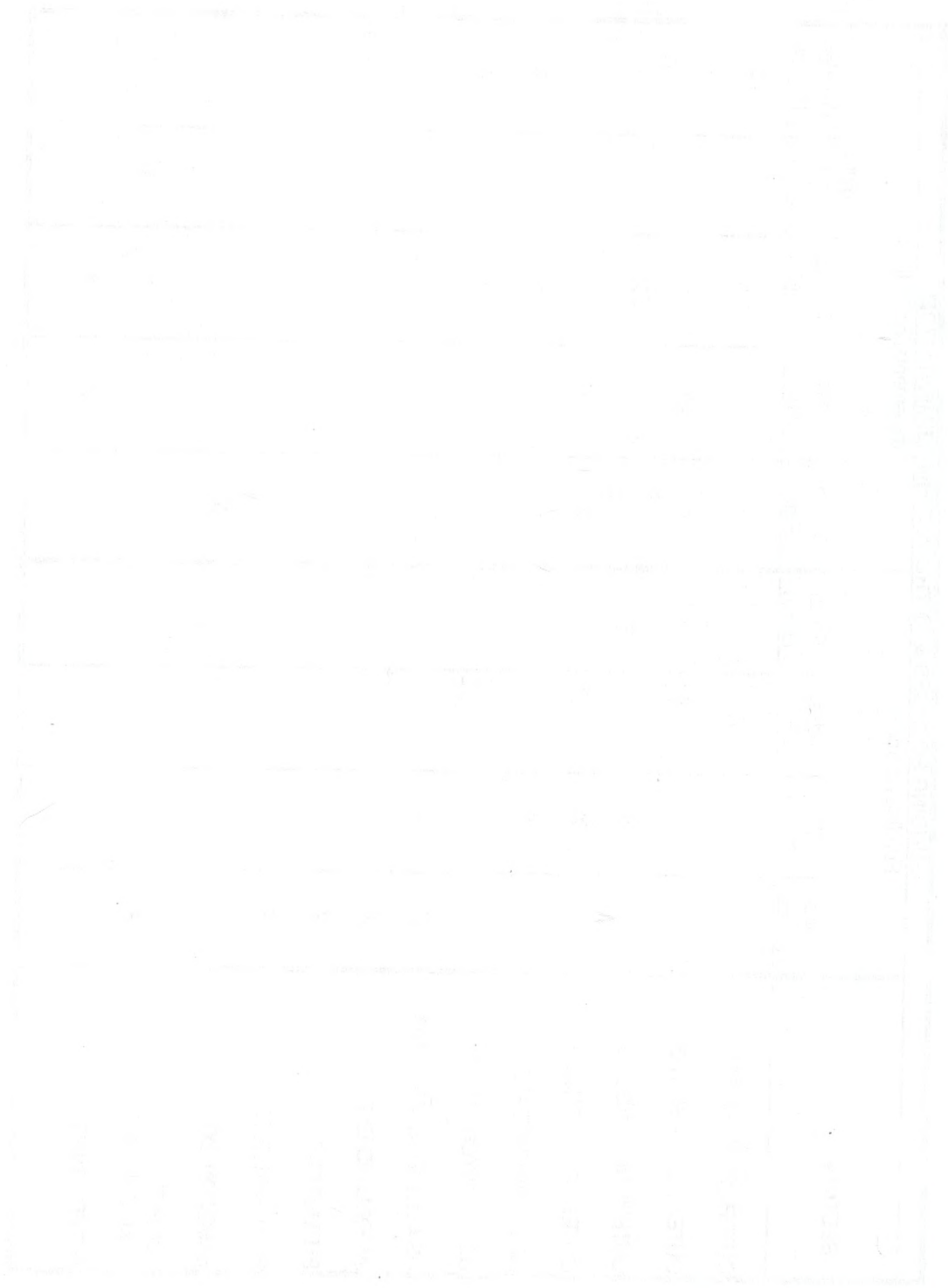


TABLE 3-2

BENEFIT COMPARISON FOR CLINTON PROJECTS

SECTION	LENGHT KM	LENGHT MI	1995 COST ($ 1000) CONST.	1995 COST ($ 1000) ROW	BENEFITS ($ 1000)	BENEFIT COST RATIO	ECONOM IMPACT	ENVIRON. IMPACT +	ENVIRON. IMPACT -
OUTER LOOP - SECT 1	2.9	1.8	3480	300	14,232	3.8	0.8	0.07	0.21
OUTER LOOP - SECT 2	1.5	0.9	1610	180	2,501	1.4	0.8	0.07	0.14
OUTER LOOP - SECT 3	4.8	3.0	5420	780	10,000	1.6	0.8	0.07	0.21
OUTER LOOP - SECT 4	2.9	1.8	11630	580	6,429	0.5	0.8	0.07	0.00
NC 24: AIRPORT - WPL	1.3	0.8	2600	100	21,947	8.1	0.6	0.07	0.07
NC 24: S. E. BLVD - EPL	3.7	2.4	3840	687	17,455	3.9	0.4	0.07	0.00
US 701: DIXON - NPL	2.7	1.7	2200	150	2,049	0.9	0.6	0.07	0.00
US 421: INDUSTRIAL - NPL	3.1	1.9	3700	140	14,287	3.7	0.6	0.07	0.00
BUTLER EXT.	0.8	0.5	540	130	1,587	2.4	0.2	0.07	0.14
ELIZABETH EXT.	0.4	0.2	220	120	5,501	16.2	0.2	0.07	0.14
LOOP ST McKOY - ELIZABETH	0.3	0.2	370	330	685	1.0	0.4	0.07	0.00
PETERSON ST	0.7	0.5	1020	50	8,866	8.3	0.2	0.07	0.29

4. ENVIRONMENTAL CONCERNS

In the past few years, environmental concerns associated with highway construction have come to the forefront of the planning process. Section 102 of the National Environmental Policy Act requires an Environmental Impact Statement for road projects that have a significant impact on the environment. The EIS includes impacts on wetlands, wildlife, water quality, historic properties and public lands. While this report does not cover the environmental concerns in as much detail as an EIS would, preliminary research was done on several factors and the information found is included below.

Threatened and Endangered Species

The Threatened and Endangered Species Act of 1973 allows the U. S. Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impacts of a road project on endangered animal and plant species, as well as critical wildlife habitats. These species and areas were located using mapping and information provided by the North Carolina Department of Environment, Health, and Natural Resources. Doing this during the planning stage should minimize the effects of road construction.

In order to avoid any endangered species, Geographic Information System (GIS) data was used to locate Natural Heritage elements. **Figure 4-A** shows the location of the one element found in the area. The Clinton Thoroughfare Plan does not affect this endangered species.

Historic Sites

Section 106 of the National Historic Preservation Act requires the Department of Transportation to identify properties listed in, as well as eligible for, the National Register of Historic Places (NRHP). The DOT must consider the impact of its road projects on these properties and consult with the Federal Advisory Council on Historic Preservation.

NC General Statute 121-12(a) requires the DOT to identify historic properties listed on the National Register, but not necessarily those eligible to be listed.

The DOT must consider impacts and consult with the North Carolina Historical Commission, but is not bound by their recommendations.

The following is a list of properties identified on the NRHP. **Figure 4-A** gives the locations of these properties (numbers in list correspond to numbered locations on figure).

1. Patrick-Carr-Herring House.
2. West Main/North Chestnutt Streets Historic District.
3. Royal-Crumpler-Parker House.
4. Pugh-Boykin House.
5. Clinton Depot.
6. Bethune-Powell Buildings.
7. Robert Herring House.
8. Graves-Stewart House.
9. College Street Historic District.
10. Francis Pugh House.
11. Pigford House.
12. General Thomas Boykin House.

The additional right of way requested could possibly affect numbers 1, 2, 6, 7, and 8 above. The location of the additional right of way will determine the effect of each. Numbers 3, 5, 9, 10, 11, and 12 should experience no affects due to Thoroughfare Plan recommendations. The Pugh-Boykin House is located on Elizabeth Street. The plan calls for Elizabeth Street to be widened to 48 feet. Design and construction should be done in such a way as to minimize the effects of this project on the Pugh-Boykin House.

Archaeological Sites

Several sites of archaeological significance exist in the planning area; however, no impacts were identified. In the interest of preserving these areas, the locations are not given in this report. Archaeological information may be obtained from the Department of Cultural Resources, Archaeology and Historic Preservation Section, 507 North Blount Street, 27604-1109.

Wetlands

Wetland ares were located using the Wetlands Inventory Mapping, provided by the U. S. Fish and Wildlife Service. These areas were located so the effects to these natural resources could be minimized. **Figure 4-B** shows the location of the National Wetland Inventory (NWI) wetland areas. The section of the proposed outer loop that runs between NC 24 and North Boulevard crosses a wetland area. The crossing was unavoidable, but was placed to minimize the effect to the wetland. The section of the proposed outer loop from Rowan Street (SR 1924) to NC 403 also goes through an identified wetland area. The location should minimize effects of the crossing while allowing an acceptable design speed on the

road. The recommended widening of NC 24 west of Clinton passes through the Great Coharie Swamp. This crossing was unavoidable.

Other

Other areas of environmental concern were identified and located using Geographic Information System (GIS) data. National Pollutant Discharge Elimination System (NPDES) points were located in the planning area. These areas were not studied in detail; rather, they were identified for the purpose of avoidance. Also, hydrologic features were identified for the purpose of avoidance. (See **figure 4-B** for location).

Only two NPDES locations were found in the planning area. The Thoroughfare Plan does not affect either of these locations.

One Superfund Site exists in the planning area. The site is in the vicinity of the portion of the proposed outer loop from Industrial Boulevard to North Boulevard (SR 1311). This area should be studied closely to determine what effects, if any, construction will have.

With any road construction, there is always the possibility of conflict with existing structures. There are two types of conflict, relocation and proximity damage. In the case where a roadway alignment passes through an existing structure, the structure is purchased and either removed or destroyed. This is considered a relocation. There are also times when the alignment does not pass through the structure, but rather passes close to the structure. The land owner is compensated for this inconvenience. This is termed proximity damages.

The proposed outer loop could cause both relocations and proximity damages. The section from Industrial Boulevard to NC 24 will probably cause proximity damages at the intersection with NC 24. The section from NC 24 to Rowan Street could cause one relocation, and a few proximity damages. The next section, from Rowan Street to Governor Moore Road, could cause 1-2 relocations and a few proximity damages. The section from Governor Moore Road to Industrial Boulevard could cause one to two relocations as it intersects existing roads. Proximity damages could be incurred as the proposed road utilizes existing section of roadways.

The proposed Butler Street Extension passes close to two existing structures. The final alignment will determine the actual damages to these structures.

The Peterson Street Extension could cause one relocation or property damage depending on the exact alignment.

The construction of Loop Street will cause one business to relocate, and possibly cause proximity damages to two others. The proposed alignment would also cause removal of parking near the Post Office.

The extension of Elizabeth Street from Lisbon Street to College Street will cause one business to relocate. The alignment also passes through an existing parking lot.

The proposed connection from John Street to Barrus Street passes through an existing apartment building. This project is currently a low priority. This connection is not expected to be constructed in the near future.

The widening of NC 24 from Airport Road to the western planning limits will require additional right of way. Currently, there is 100 feet of right of way. The plan recommends 150 feet. The proposed widening from The current four lane section to the eastern planning limits also requires additional right of way. This recommendation will cause several relocations, and a few proximity damages.

Although no widening is suggested, the plan recommends acquiring additional right of way for NC 403 from US 701 Business to the eastern planning limits. The purpose of the additional right of way is to keep this area open for potential future improvements.

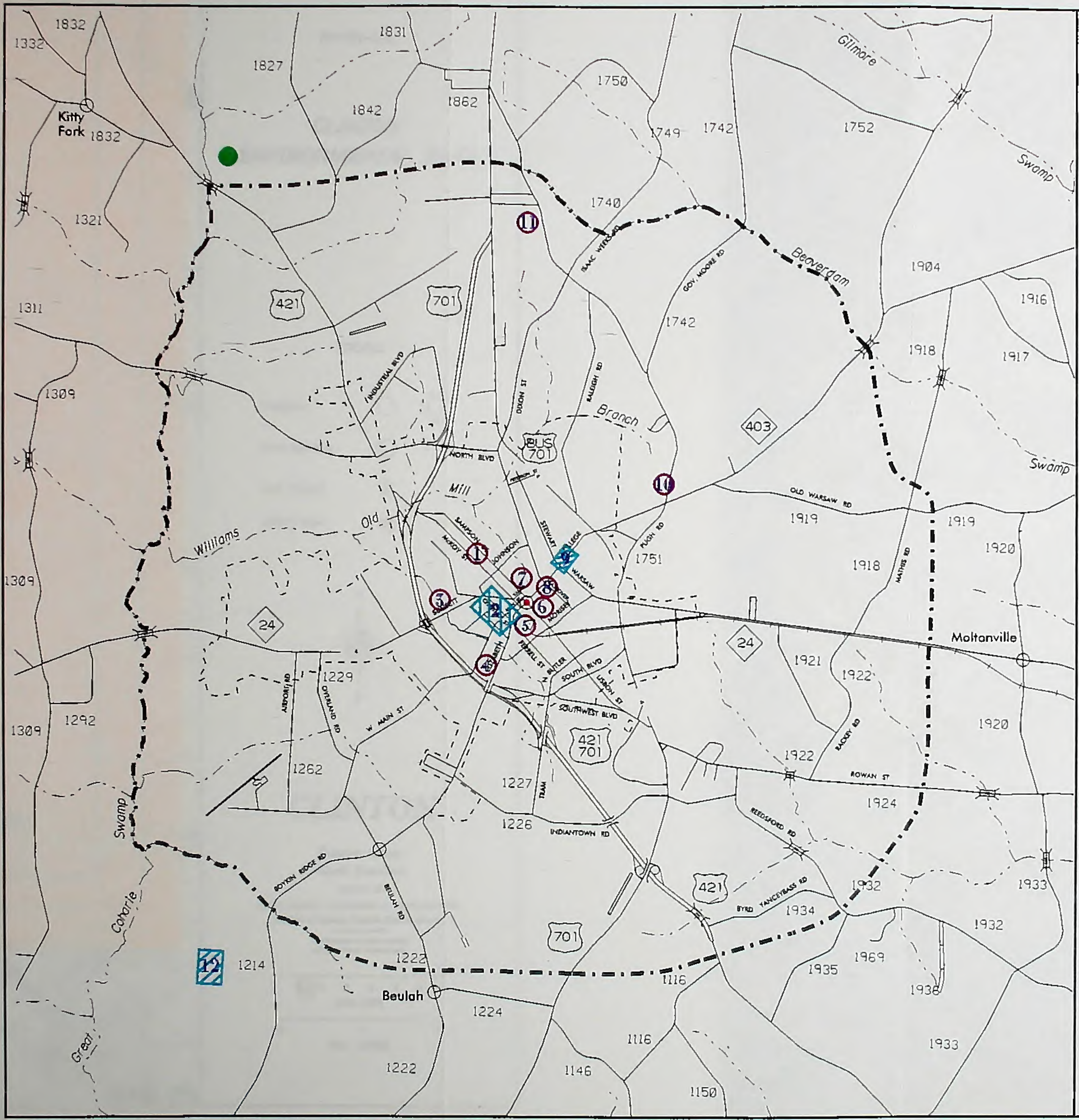


FIGURE 4-A
HISTORIC SITES

LEGEND

- HISTORIC BUILDING
- HISTORIC DISTRICT
- NATURAL HERITAGE ELEMENT

N
S

MAP DATE
MARCH 1, 1996

CLINTON

Sampson County
North Carolina

PREPARED BY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Division of Highways Statewide Planning Branch

0 1 2 3 4 5 6 7
1000 FEET

0 1 2
1000 METERS

FIGURE 4–B

CLINTON ENVIRONMENTAL DATA

LEGEND

- Interchange
- Grade Separation
- NWI Wetlands
- NPDES Point

N

S

CLINTON

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0 1 2 3 4 5 6 7
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1000 METERS

5. POPULATION, LAND USE, AND TRAFFIC

Clinton is located approximately 16 km (10 miles) west of I-40, at the intersection of US 421, US 701, NC 24, and NC 403. Due to Clinton's accessibility to the highway system, and local industry, there is a mix of local traffic and through traffic, as well as a mix of passenger cars and commercial vehicles.

Factors Affecting Transportation

Population, land use and traffic are the three major factors in determining the transportation needs of an area. In addition, travel type and frequency are also studied. The Thoroughfare planning process incorporates all these variables into a plan that best meets the needs of the area.

In order to make predictions of these variables, several factors must be examined. Historic and potential population changes, significant trends in the economy, character and intensity of land development, nature of travel, and motor vehicle registration were all analyzed for this study. In addition, factors that affect development such as zoning, availability of public utilities and transportation, and the physical characteristics of the land were also studied.

Population Trends

Since the volume of traffic on a section of roadway is related to the size and distribution of population that it serves, population data is one of the tools used to determine the needs of the system.

Although the population of Sampson County has remained fairly constant over the past 10 years, the City of Clinton has experienced an increase in population. In 1986, the County population was 48005. 1993 numbers show a total of 49352, an average annual increase of 0.4 %. During those seven years, Clinton grew from a population of 6876 to 8977, an average of almost 4 % per year. Over that same period of time, the Statewide population grew 1.4 %. The State population is expected to grow to around 8.8 million by 2020. The population in the study area is expected to grow to around 16,700 by the year 2020.

TABLE 5-1

YEAR	CLINTON POP.	SAMPSON CO POP.	NORTH CAROLINA POP.
1985	6916	48452	6,254,998
1986	6876	48005	6,323,174
1987	8111	48004	6,405,868
1988	8231	47879	6,483,344
1989	8164	47532	6,568,810
1990	8385	47297	6,632,448
1991	8698	47873	6,751,713
1992	8912	48428	6,838,230
1993	8977	49352	6,952,424
1994	9005	48233	7,064,470
2020	N/A	41193 *	8,800,000 *

* Projected population.

Land Use

Land use refers to the physical patterns of activities and functions within a town. Nearly all traffic problems in a specific area are relative to the area's land use. The amount of traffic on a particular street is very closely related to its adjacent land use. For example, a large industrial plant might be the cause of congestion during shift change hours as its workers come and go. However, during the remainder of the day, little, if any, problems might occur. The spatial distribution of different types of land use (sometimes referred to as traffic generators) is the predominant determinant of when, where, and why congestion occurs. The attraction between different land uses and their association with travel varies depending on the size, type, intensity, and spatial separation of each land use.

For Transportation Planning, land use is grouped into the following categories:

Residential- all land devoted to the housing of people with the exception of hotels and motels;

Commercial- all land devoted to retail trade including consumer and business services and their offices;

Industrial- all land devoted to manufacturing, storage, warehousing, and transportation of products;

Public- all land devoted to social, religious, educational, cultural, and political activities.

Outside the city limits of Clinton, the land is sparsely developed. Nearly all is residential, with some industrial areas. Inside the city, all types of land uses may be found. Clinton has a concentration of commercial development in the center of Town. Being the County Seat for Sampson County, Clinton also has several state and local government buildings, DOT facilities, and a hospital. Clinton also has a growing industrial park located between North Boulevard and US 421. There are also other areas of industrial as well as residential development. Along major routes in the area, specifically US 421 and NC 24, commercial and industrial development has occurred in the past few years (see **figure 5-A** for existing land use).

Barriers to future development in the Clinton area include wetland areas and flood zones. Also, the availability of water and sewer service will determine the direction of growth in this area. The construction of the Thoroughfare Plan will also affect development. The construction of the NC 24 Bypass could have a large effect on Clinton. At the time of this report, a location for this project had not been chosen. With the distance from Town being a major factor, the effects of the bypass can not be determined at this time.

Industrial Development is expected to continue in the Industrial Boulevard area. Industrial as well as commercial development will probably continue along US 701 Business as well as spreading west along NC 24 past Overland Road.

The majority of the residential development in Clinton is expected to occur along US 421 from Industrial Boulevard to the North, US 701 north of town, NC 24 East of Railroad Street, and the area between Elizabeth Street and US 701.

FIGURE 5A

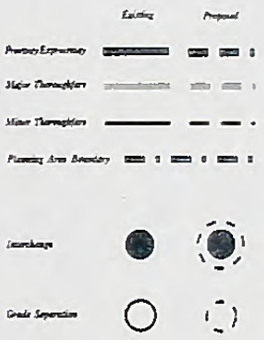
CURRENT LAND USE

INDUSTRIAL/COMMERCIAL

RESIDENTIAL

RECREATIONAL

LEGEND



N

S

MAP DATE
JUNE 11, 1996

CLINTON

Sampson County
North Carolina

PREPARED BY
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Division of Highways Statewide Planning Branch
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

0 1 2 3 4 5 6 7
1000 FEET

0 1 2
1000 METERS

Vehicle Registration

On the average, growth in vehicle registration tends to mirror growth in ADT. Vehicle registration in the Planning Area has grown at an average annual rate of 1.5 % since 1988, somewhat less than the North Carolina average of 2.4 %. During that period, the County vehicle registration growth rate matched the State growth rate of 2.4%.

TABLE 5-2

VEHICLE REGISTRATION

YEAR	CLINTON	NORTH CAROLINA
1988	18308	4,735,473
1989	20422	4,861,859
1990	18582	4,919,592
1991	18656	4,960,768
1992	19007	5,093,786
1993	19472	5,264,350
1994	20038	5,449,792

Travel Demand

Travel demand is usually measured by portable traffic counters and recorded in average daily traffic. This information is collected at several locations throughout the study area. The traffic counts at each location are compared with past counts to determine a trend. For this study, the trend over the last 10 years was studied.

In addition to the counts the DOT normally takes, special counts were done in Clinton to assist in validating the travel model. (See **Chapter 6 - Model Development** for further explanation).

The location and type of employment in an area has a very large effect on the type and amount of travel. For this study, employment totals were collected from each business in the study area. (Totals by type and zone may be found in **Appendix D** of this report). In 1995, there were 9224 persons employed in the planning area. This number is expected to grow to 12400 by the year 2020. Meetings were held with the City to discuss the location of the new employment based on anticipated development in the area.

6. MODEL DEVELOPMENT

In order to analyze the current system, as well as any improvements, a traffic model was created. This chapter discusses the type of information gathered, and the processes involved in building the model.

The study area is delineated by a cordon line. This line was placed to include not only the Town, but also that area that would have urban characteristics in the planning horizon, the year 2020. To the west, the Coharie Swamp presents a natural barrier to expansion. This was used as a section of the cordon line. The rest was determined by current land use, future land use projections, and discussions with Town Officials. The cordon line is shown in **figure 6-B**, labeled Planning Area Boundary.

Next, the planning area was divided into Traffic Analysis Zones (TAZs) for the purpose of data collection (see **figure 6-A**). The zones were chosen in such a way as to include similar land uses in each zone. Higher density areas were broken up into several small zones, while the lower density areas were placed in large TAZs. Every dwelling unit (DU) in the planning area was counted and rated based on trip making ability. Employment was also counted and placed into groups by Standard Industrial Code (SIC). Commercial vehicles were also counted by zone.

The model uses this data to predict travel for three types of trips. Internal trips are trips with both origin and destination inside the planning area. Internal-external trips have one end within, and one end outside the planning area. The third type, through trips, pass through the planning area, but have both ends outside the area.

To create the model, a three step process in employed. Trip generation is the first step, followed by trip distribution, and finally trip assignment.

For trip generation, the data collected regarding employment, DUs, and commercial vehicles is converted to trips, determining how many trips are produced in and attracted to each zone. DU, or housing totals, are converted to productions using generation rates (see **Appendix C**). These trips are attracted to zones based on employment totals. This is accomplished using a set of regression equations developed specifically for this study (see **Appendix C** for regression equations). Trips were divided into type: Home Based Work (HBW), Other Home Based (OHB), Non Home Based (NHB), and External-Internal (E-I), each type having a unique regression equation.

Next comes trip distribution. The gravity model was used to distribute trips across the network based on the relative attractiveness of the destination zone and the distance from the productions. The simplified gravity model formula is as follows:

$$T_{ij} = \frac{P_i * A_j * F_{ij} * K_{ij}}{\text{sum } j = 1,\ n\ (A_j * F_{ij} * K_{ij})}$$

where

T_{ij} = Trips from zone i to zone j.

P_i = Trips produced at zone i.

A_j = Trips attracted by zone j.

F_{ij} = Friction factor from zone i to zone j.

K_{ij} = Socioeconomic adjustment factor between zone i and zone j.

The next step, trip assignment, loads the trips onto the road network. This is accomplished by determining the minimum path for each trip. Once the trips are loaded, the computer generated volumes on the roads are compared to actual ground counts along a screen line. The model is said to be calibrated when the computer generated screenline totals are within 5 % of the actual ground counts. These screen lines were chosen in the early stages of the process. One screen line runs from the southwest section of the planning area to the northeast section. The second runs from the northwest section of the planning area to the southeast section. The screen lines are shown in **figure 6-B**. Counts were taken where roads crossed the screenlines and cordon line. In addition, counts were taken at various locations to help determine travel patterns as well as validate the model. These count locations are shown in **figure 6-C**.

Employment and population projections are then made for the year 2020. The process is repeated using the projected future employment and housing totals in order to create a network for the year 2020. **Table 6-1** shows the population and employment totals of the planning area. The 2020 model was then used to evaluate the existing network to determine deficiencies in the system. Next, the 1980 Thoroughfare Plan

was put into the model. The plan was tested to see what additions were needed. From this, the current Thoroughfare Plan was developed and tested. The data used to create this model is included in **Appendix C - Appendix I**.

Table 6-1

PLANNING AREA POPULATION AND EMPLOYMENT

	1995	2020
POPULATION	13500	16700
TOTAL EMPLOYMENT	9300	12300
INDUSTRIAL	2600	3400
RETAIL	1300	1700
HIGHWAY RETAIL	600	900
OFFICE	1100	1400
SERVICE	3700	4900
EMPLOYMENT/POPULATION	.69	.74
DWELLING UNITS	5200	7000

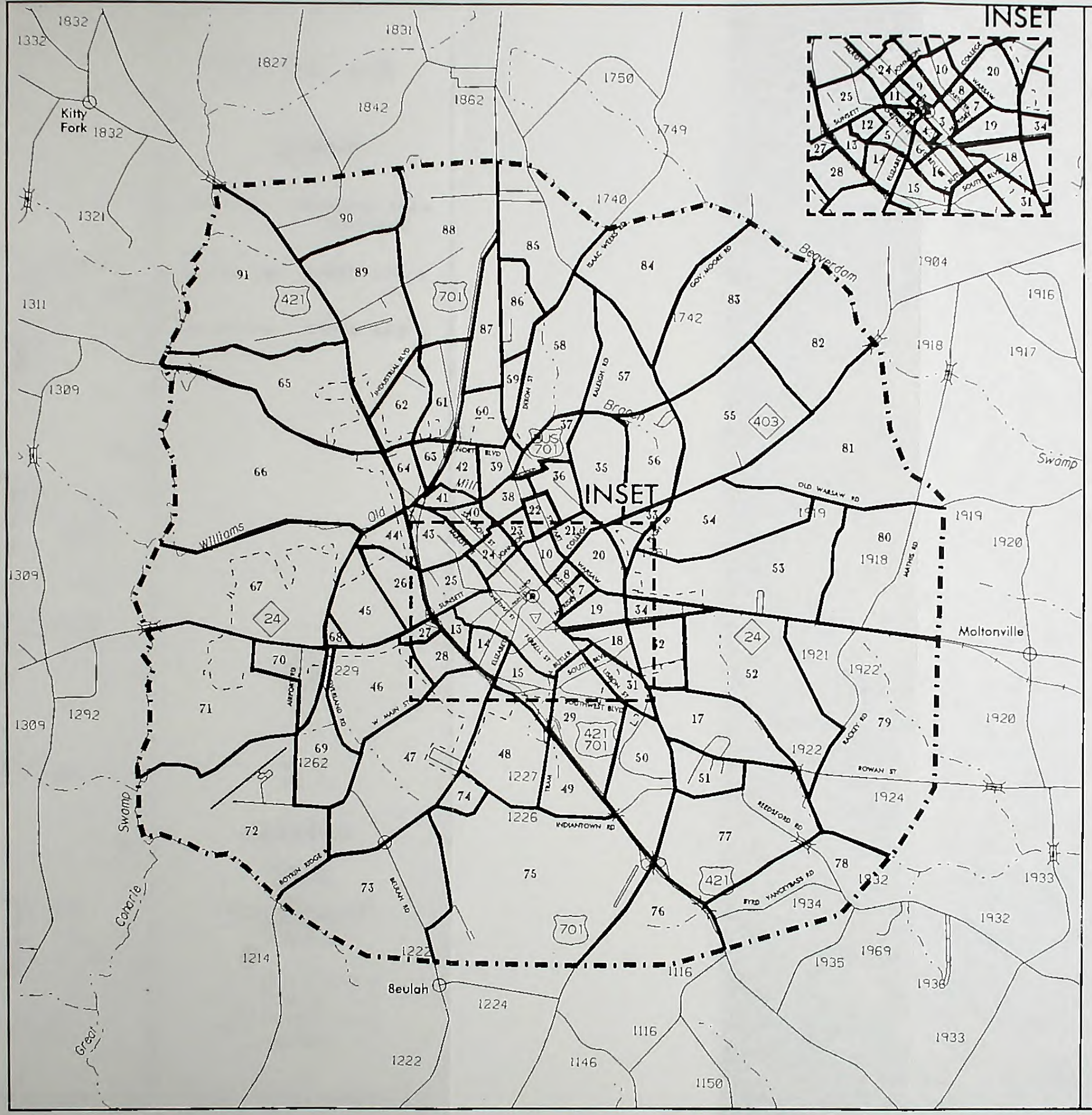


FIGURE 6-A

LEGEND

PLANNING AREA BOUNDARY

00 ZONE NUMBER

N

S

MAP DATE
MARCH 1, 1996

CLINTON

Sampson County
North Carolina

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FEDERAL HIGHWAY ADMINISTRATION

FIGURE 6-B

LEGEND

PLANNING AREA BOUNDARY

SCREEN LINE 1

SCREEN LINE 2

N

S

MAP DATE
MARCH 1, 1996

CLINTON

Sampson County
North Carolina

prepared by
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Division of Highways Statewide Planning Branch

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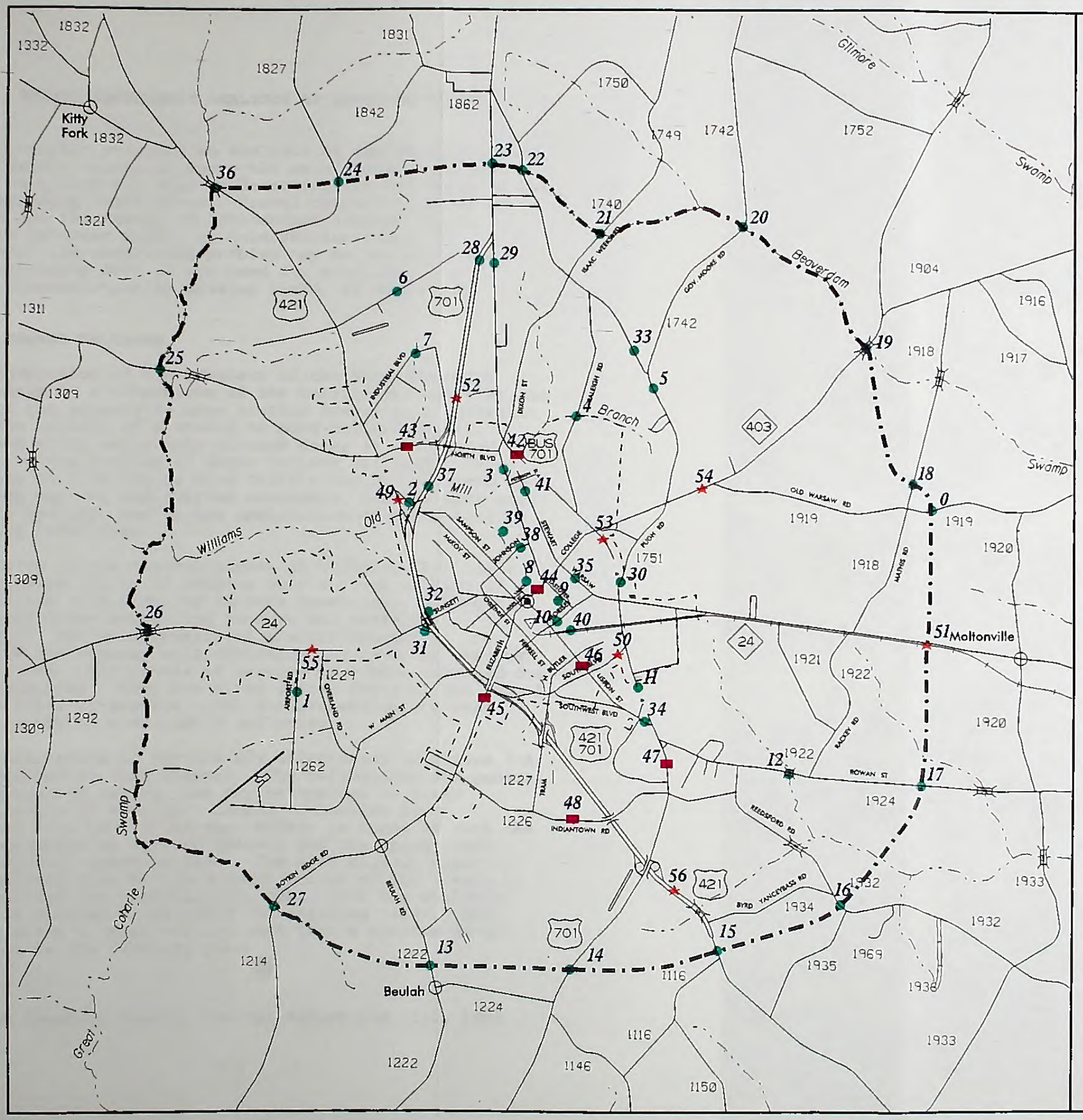

FIGURE 6-C

COUNT LOCATION MAP

LEGEND

Daily Count

Hourly Count

Classification Count

MAP DATE

MARCH 1, 1996

CLINTON

Sampson County

North Carolina

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Division of Highways Statewide Planning Branch

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1000 METERS

7. TRAVEL DEFICIENCY ANALYSIS OF EXISTING SYSTEM

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies but on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be caused by the system deficiency such as the need for a bypass, loop facility, construction of missing links, or additional radials.

Existing Travel Patterns

An indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with minimum delay is controlled primarily by the spacing of major devices utilized. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by the application of other traffic engineering techniques.

Capacity is the maximum number of vehicles that has a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given period under prevailing roadway and traffic conditions.[1] The relationship of traffic volumes to the capacity of the roadway will determine the **level of service** being provided. Six levels of service have been selected for analysis purposes. They are given letter designations from A to F with level-of-service (LOS) A representing the best operating conditions and LOS F the worst.

The six levels of service are illustrated in **figure 7-A**, and are defined in this chapter. The definitions are general and conceptual in nature, but may be applied to urban arterial levels of service. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variable used to describe them. The 1985 Highway Capacity Manual contains more detailed descriptions of the levels of service defined for each facility type. For our analysis, capacity is assumed to be LOS D for existing roads. New roads are given a cross section such that a minimum of LOS C would exist in the planning year.

---

1. Highway Capacity Manual, Special Report 209, 1-3, 1985

Level of service A describes primarily free-flow operation at speeds around 90 percent of the free-flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.

Level of service B represents reasonable unimpeded operation at speeds around 70 percent of the free flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.

Level of service C represents stable operations. However, ability to maneuver and change lanes in mid-block locations may be more restricted than in level of service B, and longer queues and/or adverse signal coordinations may contribute to lower average travel speeds of about 50 percent of the average free flow speed for the arterial class. Motorists will experience an appreciable tension while driving.

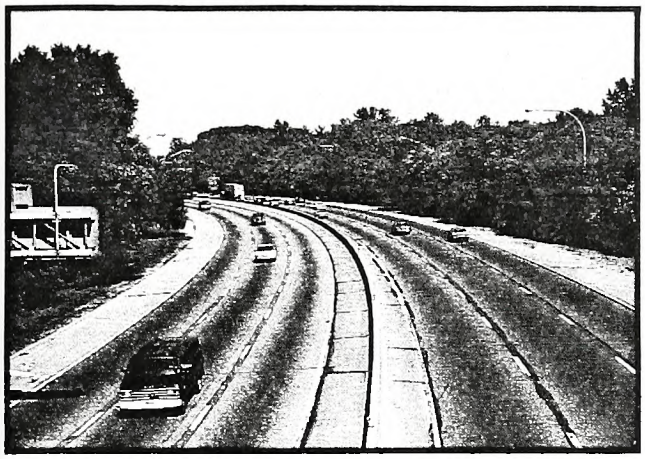
Level of service D borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence decreases in arterial speed. Delay may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free flow speed.

Level of service E is the level at which operations are extremely unstable, because there are almost no gaps in the traffic stream. Any disruption in the traffic stream, such as a vehicle entering from a ramp, or changing lanes requires the following vehicles to give way to admit the vehicle. This condition establishes a disruption wave which propagates through the upstream traffic flow. The boundary between LOS D and LOS E describes operation at capacity. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce serious breakdown with extensive queuing.

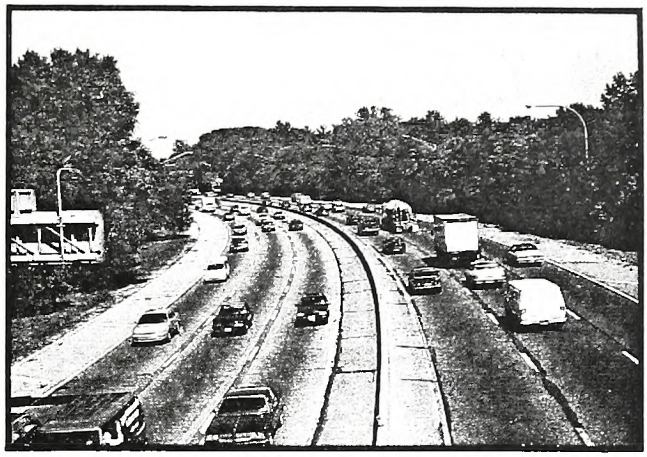
Level of service F describes forced or breakdown flow. The arterial flow is at extremely low speeds; below one third to one fourth of the free flow speed. Intersection congestion is likely at critical signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.

FIGURE 7-A

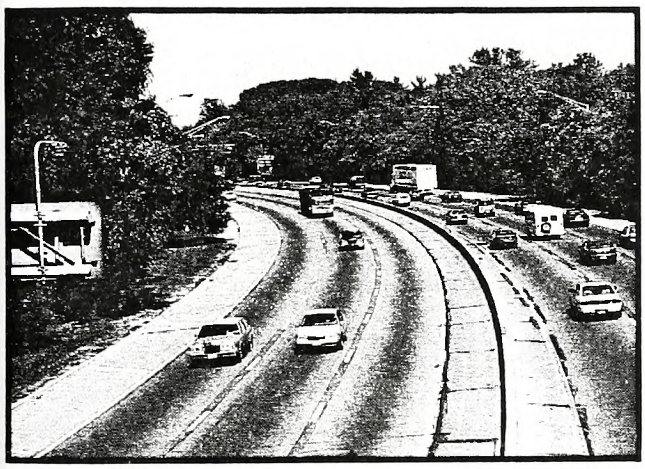
Source: 1994 Highway Capacity Manual



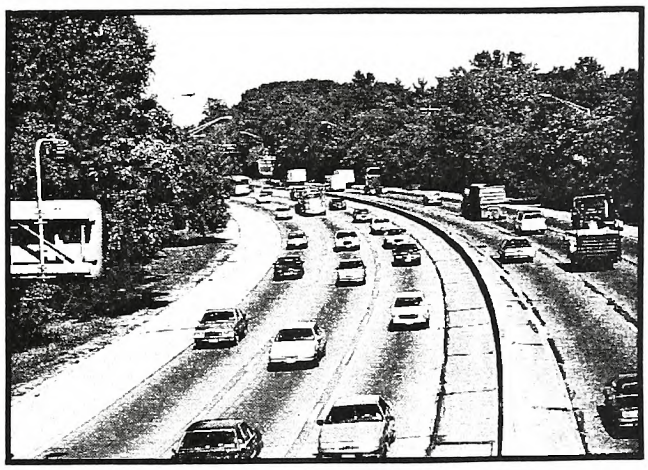
LOS A.



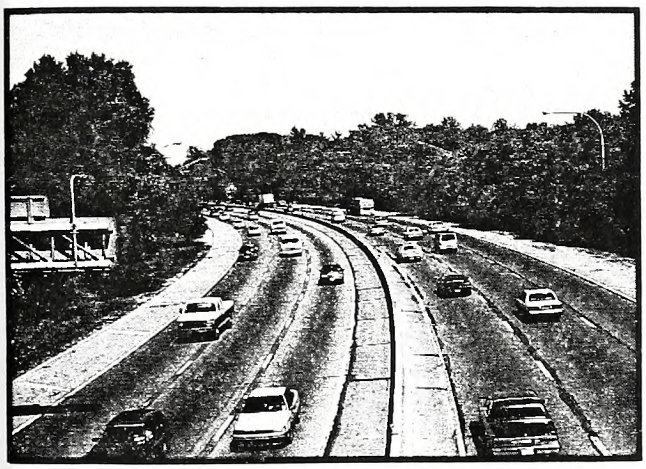
LOS D.



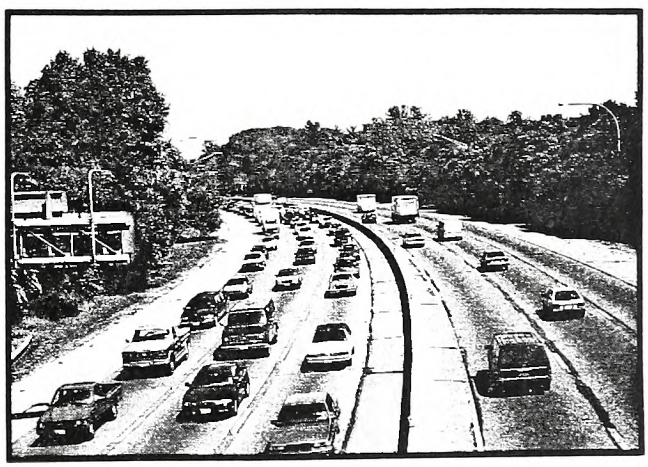
LOS B.



LOS E.



LOS C.



LOS F.

LEVELS OF SERVICE

Safety, and Alignment Deficiencies

North Carolina's standards for highway construction call for 3.3 meter (11 foot) lanes on all highways with traffic volumes greater than 2000 ADT (average daily traffic), or design speeds greater than 90 km/h (55 Mph). A 2.4 meter (9 foot) lane width may be used on collector roads with an ADT of less than 400 vehicles per day. The minimum level of service for minor collector roads requires a 40 Mph average overall travel speed during peak traffic conditions.

TABLE 7-1

Minimum Tolerable Lane Widths			
ADT	Principal Arterials m (ft)	Minor Arterials m (ft)	Collectors m (ft)
over 2000	3.3 (11)	3.3 (11)	3.3 (11)
400-2000	--	3.0 (10)	3.0 (10)
100- 400	--	3.0 (10)	2.7 (9)
below 100	--	--	2.7 (9)

High Accident Intersection Locations.

Traffic accident records aid in defining problem areas and often pinpoint a deficiency such as poor design, inadequate signing, ineffective parking, or poor sight distance. Accident patterns developed from analysis of accident data can lead to improvements to reduce the number of accidents.

Both the severity and number of accidents should be considered when investigating accident data. The severity of every accident is measured with a series of weighting factors developed by NCDOT's Division of Highways. In terms of these factors, a fatal or incapacitating accident is 47.7 times more severe than one involving only property damage. An accident resulting in minor injury is 11.8 times more severe

than one with only property damage. Table 7-2 is a summery of accidents in Clinton from January 1992 thru December 1994. Only intersections with 15 or more accidents during this period are included.

The "Total" column is the total number of accidents within 100 feet of the intersection during the indicated period. The severity listed is the average accident severity for that location.

TABLE 7-2

CLINTON
High Accident Intersection Locations

Road	At	Total	Severity
Southeast	Warsaw	53	7.66
US 421	Sunset	21	4.52
Sunset	Westover	17	12.53
Northeast	Smith	16	8.98

These intersections warrant further study to determine the cause, and possible solutions. This, however, is beyond the scope of this study.

Bridge Conditions

In addition to all the inconveniences that bridge failures cause, they also represent the greatest risk of all highway failures for loss of life. For this reason it is important that bridges be built to the same standards as the highway system they serve.

The North Carolina DOT's Bridge Maintenance Unit, along with consultants, has inspected every bridge on the State Highway System. During this inspection, a sufficiency rating was assigned to each bridge. Factors used in determining the sufficiency rating include structural adequacy and safety, serviceability and functional obsolescence, essentialness for public use, structure type, and traffic safety features. The result is in percentage form with 100 % being entirely sufficient. A rating of 50 % or less qualifies a bridge for Federal Replacement Funds under the National Bridge Inspection Program (Federal Highway Act 1968).

Only one bridge in the Clinton Planning Area had a structural deficiency rating of less than 50 % . Bridge # 112 carries SR 1311, is located 2.1 miles west of US 421, and has a rating of 13.4 % . There were no bridges that received a rating of 50 % or less in the category termed functionally obsolete in the Planning Area.

8. ALTERNATIVES ANALYSIS

The first step in any alternatives analysis is to investigate the **no build alternative.** The no build alternative assumes that no improvements will be made to the transportation system within the planning period. The positive aspects of the no build alternative include no monetary investment, no relocation of persons or businesses, and no disruption due to road construction. However, the no build alternative presents several problems for this particular study. Several roads in the area will be at or near capacity within the planning period if no improvements are made. Specifically, sections of US 421, NC 24, Beamon St., Johnson St. and North Blvd. will be over capacity by the year 2020. Also, sections of US 421, US 701 Bus., NC 24, Railroad St., Johnson St., Rowan St., College St., and Beamon St. will have an approximate volume to capacity ratio of between 0.8 and 1.0.

The **existing plus committed system** (E+C) was tested next. The only improvements listed in the 1996 Transportation Improvement Program (TIP) are the NC 24 Bypass and the widening of North Blvd. The only difference between the E+C network and the no build alternative is the situation on North Blvd and NC 24. Congestion along North Boulevard is reduced due to widening of the existing road. NC 24 through Clinton will experience a reduction in volume due to a proposed bypass. The NC 24 Bypass, when constructed, will remove much of the through traffic currently using the existing section.

Since there was an **existing Thoroughfare Plan** for Clinton, this was the next alternative to be tested. The old plan was added to the model as if these were the only improvements to be made within the planning period. The old plan contained several good elements which would benefit the cities transportation system. However, the old plan was only designed to accommodate growth through the 1990's. As Clinton continues to grow, further improvements will need to be made to the old plan. Routes such as NC 24, US 421, and Johnson Street would have been over capacity by the year 2020.

Alternative A adds the following recommendations to the old plan. US 421 should be widened to four lanes from its current four lane section to Brown's Church Road. NC 24 should be multilaned from its current five lane section to the western planning limits (Coharie Swamp). Also, the location of one section of the Outer Loop was altered. Development along Industrial Boulevard made the old alignment less attractive. The new location is slightly north of the old one. This allows the loop to be completed, as well as allowing this area to continue developing. A bypass of NC 24

around Clinton has been planned for several years, however, the location has not yet been chosen. The bypass is not shown in Alternative A because the location is assumed to be outside of the Planning Area. The bypass will still have an effect on the traffic in Clinton. The bypass effects were considered when developing and testing Alternative A.

Alternative B is essentially the same as alternative A. The only difference is how the potential traffic problems along Fayetteville Street are handled. For Alternative B, several streets that now intersect Fayetteville Street would be cul-de-saced to prevent traffic from entering Fayetteville Street. This would allow traffic on Fayetteville Street to move more freely, and prevent back-ups due to turning traffic. This option handled traffic well, but created additional effects to the local residents. There would be the inconvenience to, or possible displacement of, residences due to the needed construction. Also, the plan would route traffic to the intersection of Fayetteville and Sunset, adding to the traffic problems at this location. The amount of traffic served by this alternative did not justify its negative elements.

Alternative C was the same as Alternative A with no bypass of NC 24 around Clinton. The lack of a multilane facility on new location makes this alternative the least environmentally damaging. The negative aspect of this is the situation that will exist on NC 24 without the bypass. The area is already heavily travelled, and in many spots, heavily developed. Widening NC 24 through Clinton, especially between the Coharie Swamp and US 701 Bypass, would be very damaging to the existing residential and commercial development. For this reason, Alternative C was not chosen as the preferred alternative.

During meetings with the City Staff and Officials, concerns were voiced over a few elements of the old plan. The first being the extension of Woodland Drive. The proposed alignment bounds a cemetery to the west and a large drainage ditch to the east. The alignment would have effected part of the cemetery, and required relocation of the ditch. Low traffic volumes were forecast for this section. Due to these effects, and low benefits, the extension was removed from the plan. Similarly, the widening of Barrus Street to a three lane section was found to be unnecessary. Due to the proximity of several businesses along Elizabeth, the recommended widening was suggested to go from Indian Town Road to Morisey Street. These suggestions were incorporated into all alternates. After considering the options, **Alternative A was chosen as the recommended alternative (see figure 2-A).**

9. PUBLIC INVOLVEMENT

The initial step in the public participation phase of the plan was a **Goals and Objectives survey.** Approximately 150 surveys were distributed. Of these 16 were returned. From these surveys, we try to determine what factors in the decision making process are most important to the people in the area.

The following topics were rated on a scale of 1 to 5, 1 being least important, 3 neutral, and 5 most important. The following is a list of those topics and the average of all responses.

TOPIC	AVERAGE RATING
SAFETY	5.0
ATTRACTING NEW INDUSTRY	4.7
PLAYGROUNDS AND PARKS	4.3
CONSTRUCTION COST	4.2
CONTROLLING VEHICLE NOISE AROUND RESIDENTIAL AREAS	4.2
REDUCING VEHICLE POLLUTION	4.1
IMPROVING EXISTING ROAD SYSTEM	4.0
EASE OF TRAVEL	3.9
PARKING	3.9
NEW SHOPPING CENTERS	3.8
TRAVEL TIME	3.8
SIDEWALKS	3.6
PRESERVATION OF WILDLIFE AND THEIR HABITATS	3.5
PUBLIC TRANSPORTATION	3.5
PRESERVATION OF HISTORIC SITES	3.4
COST OF TRAVEL	3.3
PEDESTRIAN GREENWAYS	3.3
CARPOOL/VANPOOL	3.1
BICYCLE ROUTES	3.1
BETTER ACCESS TO CENTRAL BUSINESS DISTRICT	2.8

Also, to aid in the decision making process, three questions were asked, with responses rated from first choice (1) to last choice (3). The questions and responses are listed below. The average rating for each response is listed beside its response.

A STREET HAS BECOME SO CONGESTED THAT IT IS ALMOST IMPASSABLE AT RUSH HOUR. RANK THE FOLLOWING ALTERNATIVES FROM (1) FIRST CHOICE TO (3) LAST CHOICE.

2.9 DO NOTHING, ALLOW CONGESTION TO REMAIN

1.8 WIDEN THE STREET, CAUSING A FEW RESIDENTS AND BUSINESSES TO RELOCATE.

1.3 CONSTRUCT A NEW STREET NEARBY TO CARRY PART OF THE TRAFFIC, CAUSING A FEW RESIDENTS TO RELOCATE.

A STREET HAS BECOME SO CONGESTED THAT IT IS ALMOST IMPASSABLE AT RUSH HOUR. RANK THE FOLLOWING ALTERNATIVES FROM (1) FIRST CHOICE TO (3) LAST CHOICE.

1.6 WIDEN THE STREET, CONSTRUCT ADDITIONAL LANES

1.5 REMOVE PARKING ON THE STREET, USE FULL WIDTH FOR TRAVEL LANES

2.9 DO NOTHING, ALLOW CONGESTION TO REMAIN

POOR ROAD CONDITIONS CAUSE TRAFFIC TO BACK UP ON A PARTICULAR STREET. RANK THE FOLLOWING ALTERNATIVES FROM (1) FIRST CHOICE TO (3) LAST CHOICE.

3.0 DO NOTHING, ALLOW CONGESTION TO REMAIN

1.5 ENACT A BOND FOR STREET REPAIRS

1.5 HAVE CITY REPAIR STREET WHEN BUDGET ALLOWS

On February 19, 1996, the City Planning Board got their first look at the proposed Clinton Thoroughfare Plan. Comments from the Board Meeting were used to revise the original plan to better fit the needs of the City. On March 18, 1996, the Planning Board voted to accept the plan and recommend it to the City Council for adoption.

The plan was presented to the City Council at their May 7 meeting. The Council requested a Public Hearing on the plan to allow citizens an opportunity to see the plan and make comments before the City adopted the recommended plan.

A public hearing was held Tuesday, July 2, 1996. The only question concerning the plan came from a resident who questioned the need of the Carter Street extension from McKoy Street to Barden Street. Since there were other streets in the vicinity that connected McKoy and Barden, he questioned the need for another connection. Without the proposed connector, there would be an offset in the path. The need for that connection is based on the fact that the offset would reduce the efficiency of the proposed road. It would reduce capacity and possibly create more accidents due to the addition of a turn.

At the close of the Public Hearing, the City Council voted unanimously to adopt the Clinton Thoroughfare Plan.

10. THOROUGHFARE PLANNING PRINCIPLES

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. The street system should be well planned, since the system is permanent and expensive to build and maintain. Thoroughfare Planning is the process public officials use to assure the development of the most appropriate street system that will meet existing and future travel desires within the urban area.

Objectives of Thoroughfare Planning

The primary aim of a transportation plan is to guide the development of the urban transportation system in a manner consistent with changing traffic demands. Through proper planning for street development, many costly errors and much needless expense can be averted. A transportation plan will enable street improvements to be coordinated with other system improvements as traffic demands increase, and help eliminate unnecessary improvements. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained that will require a minimum amount of land for street purposes. In addition to providing for traffic needs the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial, and industrial enterprises, affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

(1) To provide for the orderly development of an adequate major street system as land development occurs;

(2) To reduce travel and transportation costs;

(3) To reduce the cost of major street improvements to the public through the coordination of the street system with private action;

(4) To enable private interests to plan their actions, improvements, and development with full knowledge of public intent;

(5) To minimize disruption and displacement of people and businesses through long range advance planning for major street improvements;

(6) To reduce environmental impacts such as air pollution, resulting from transportation;

(7) To increase travel safety.

Thoroughfare planning objectives are achieved through both: (1) improving the operational efficiency of thoroughfares; and (2) improving the system efficiency through system coordination and layout.

Operational Efficiency

A street's operational efficiency is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, a street's capacity is defined as the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving vertical and horizontal alignment, and eliminating roadside obstacles. For example, widening of a street from two to four travel lanes more than doubles the capacity of the street. This additional maneuverability for traffic reduces impedances caused by slow moving or turning vehicles and adverse effects of horizontal and vertical alignments.

Operational ways to improve street capacity include:

(1) Control of access - A roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.

(2) Parking removal - Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking vehicles and vehicles pulling out from spaces.

(3) One-way operation - The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

(4) Reversible lanes - Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.

(5) Signal phasing and coordination - Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

(1) Encourage people to form carpools and vanpools for journeys to work and other trip purposes. This reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.

(2) Encourage the use of transit and the bicycle mode.

(3) Encourage industries, business, and institutions to stagger work hours or establish variable work hours for employees. This will reduce travel demand in peak periods and spread peak travel over a longer time period.

(4) Plan and encourage land use development or redevelopment in a more travel efficient manner.

(5) Plan and encourage the use of sidewalks to more adequately reflect the communities needs.

System Efficiency

Another means for altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Functional Classification

Streets perform two primary functions--traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property lead to intolerable traffic flow friction and congestion. A control of access freeway is an example of a facility that performs only traffic service.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land

service conflict. Streets are categorized to function as local access streets, minor thoroughfares, or major thoroughfares (See **Figure 10-A**).

Local Access Streets provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations on the streets would be served. Local streets may be further classified as either residential, commercial, and/or industrial depending upon the type of land use which they serve.

Minor Thoroughfares are more important streets in the city system. They collect traffic from local access streets and carry it to the major thoroughfare system. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function which may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

Major Thoroughfares are the primary traffic arteries of the city. Their function is to move intracity and intercity traffic. The streets which comprise the major thoroughfare system may also serve abutting property, however, **their major function is to carry traffic.** They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare to carry traffic and each driveway is a danger and an impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

Idealized Major Thoroughfare System

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desire lines of travel within an urban area and which permits movement between various areas of the city with maximum directness is the radial-loop system. This system consists of several functional elements-radial streets, cross town streets, loop system streets, and bypasses (**Figure 10-A**). While every city's street system can not conform to the "Idealized Thoroughfare Plan" because of local idiosyncrasies, the concepts are adequate to apply to all areas.

Radial streets provide for traffic movement between points located in the outskirts of the city and the central area. This is a major traffic movement in most cities, and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of **cross town streets** which form a loop around the central business district. This system allows traffic moving from origins on one side of the central area to destinations on the other to follow the area's border and allows central area traffic to circle and then enter the area near a given destination. The effect of a good cross town system is to free the central area of cross town traffic, thus permitting the central area to function more adequately in its role as a pedestrian shopping area.

Loop system streets move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area, and they are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

A **bypass** is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing from it traffic which has no desire to be in the city. Bypasses are usually designed to through highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, system efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, thoroughfare planning is done for established urban areas and is constrained by existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect major street locations.

Throughout the thoroughfare planning process it is necessary from a practical viewpoint that certain basic principles be followed as closely as possible. These principles are as follows:

1. The plan should be derived from a thorough knowledge of today's travel - its component parts, as well as the factors that contribute to it, limit it, and modify it.

2. Traffic demands must be sufficient to warrant the designation and development of each major street. The thoroughfare plan should be designed to accommodate a large portion of all major traffic movements on a relatively few streets.

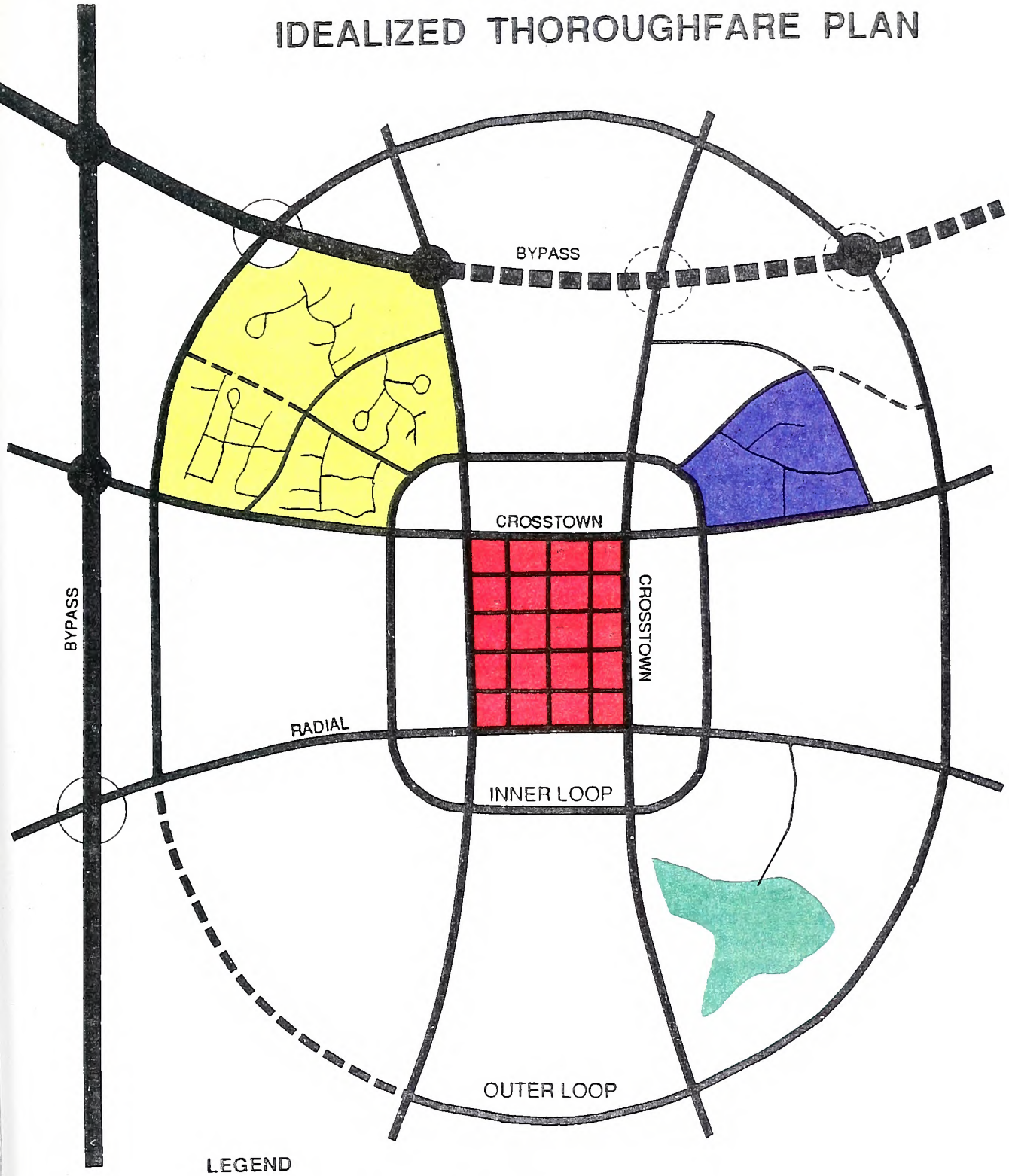
3. The plan should conform to and provide for the land development plan of the area.

4. Certain considerations must be given to urban development beyond the current planning period. Particularly in outlying or sparsely developed areas which have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect rights of way for future thoroughfare development.

5. While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.

FIGURE 10-A

IDEALIZED THOROUGHFARE PLAN



LEGEND

EXISTING PROPOSED

OR THOROUGHFARE
EEWAY
JOR OTHER
OR THOROUGHFARE
AL ROAD
ERCHANGE
DE SEPERATION

LAND USES

COMMERCIAL/BUSINESS
RESIDENTIAL
INDUSTRIAL
PUBLIC/INSTITUTIONAL

APPENDIX A

TYPICAL THOROUGHFARE CROSS SECTIONS

Cross section requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each street section must be individually analyzed and its cross section requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way.

Typical cross sections are shown in Figure **A-A**. These cross sections are typical for facilities on new location and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross sections should be developed that meet the needs of the project.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way. The recommended typical cross sections for the thoroughfares are given in Appendix **A** along with other pertinent information.

On all existing and proposed major thoroughfares delineated on the thoroughfare plan, adequate right-of-way should be protected or acquired for the ultimate cross sections. Ultimate desirable cross sections for each of the thoroughfares are listed in Appendix **A**. Recommendations for "ultimate" cross sections are provided for (1) thoroughfares which may require widening after the current planning period; (2) for thoroughfares which are borderline adequate and accelerated traffic growth could render them deficient; and (3) for thoroughfares where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

Recommended design standards relating to maximum and minimum grades, minimum sight distances, maximum degree of curve and related super elevation, and other considerations for thoroughfares are given in Appendix **B**. This Appendix gives definitions and design standards recommended for inclusion in subdivision regulations.

Cross sections "A" and "L" is typical for controlled access freeways. The 14 m (46 ft) grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 70 m (228 ft) depending upon cut and fill requirements.

Cross section "B", seven lane curb and gutter, should not be used for new projects. When the conditions warrant six lanes, cross section "D" should be recommended. Cross section "B" should be used only in special situations such as when widening from a five lane section and right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section "D" is the final cross section.

Cross section "C", five lane curb and gutter, is typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "D", "E", and "M" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections. The 4.9 m (16 ft) median is the minimum recommended for an urban boulevard type cross section. In most instances, monolithic construction should be utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In special cases, grassed or landscaped medians may be used in urban areas. However, these types of medians result in greatly increased maintenance costs and an increased danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

Cross section "F" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 7.3 m (24 ft) is recommended with 9.1 m (30 ft) being desirable.

Typical cross section "G" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections. This cross section should be used only if the above criteria is met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

In urban environments, thoroughfares which are proposed to function as one-way traffic carriers would typically require **cross section "H". Cross sections "I" and "J"** are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. **Cross section "I"** would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

Cross section "K" is used in rural areas or for staged construction of a wider multi-lane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For areas that are growing and future widening will be necessary, the full right-of-way of 30 m (100 ft) should be required. In some instances, local ordinances may not allow the full 30 m (100 ft). In those cases, 21 m (70 ft) should be preserved with the understanding that the full 30 m (100 ft) will be preserved by use of building setbacks and future street line ordinances.

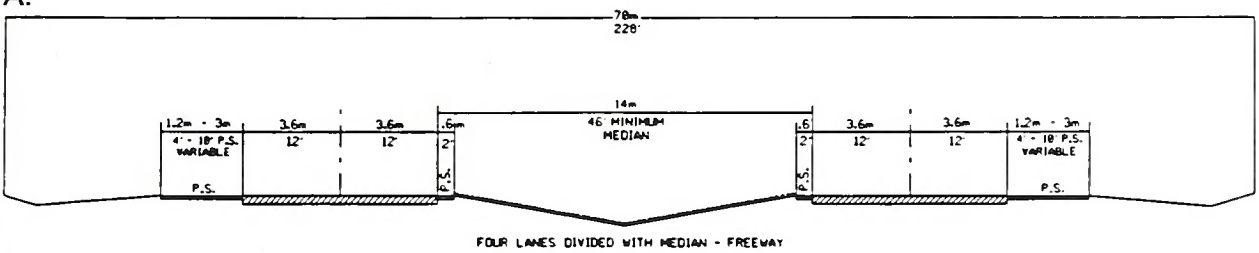
The urban curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The right-of-ways shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities. **Cross sections N, O, and P** are typically used to accommodate bicycle travel.

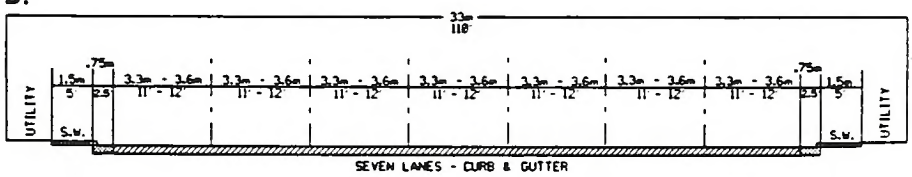
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



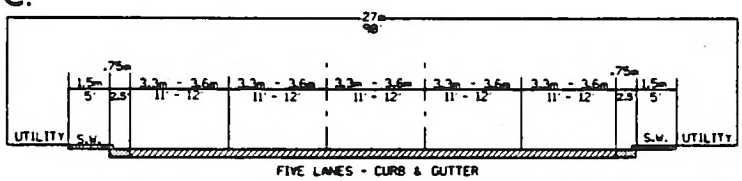
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



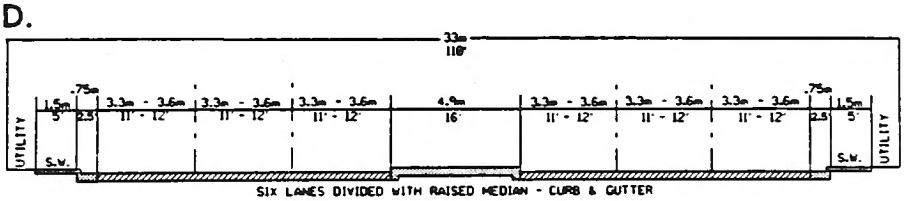
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

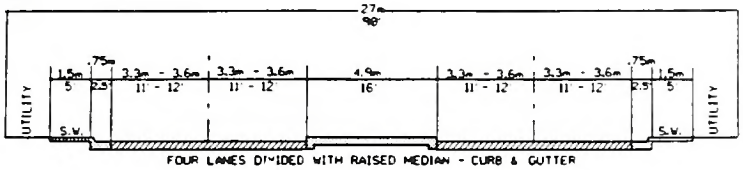
D.



SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

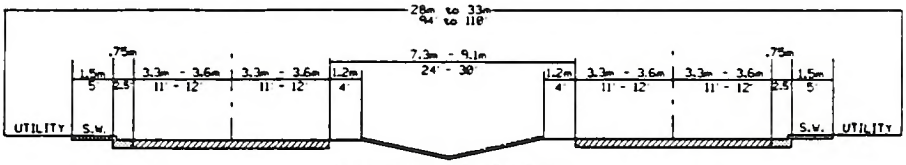
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



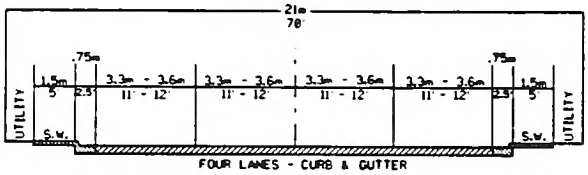
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



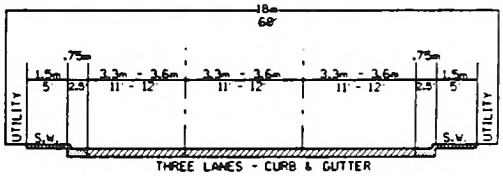
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



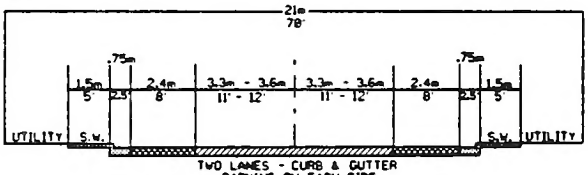
FOUR LANES - CURB & GUTTER

H.



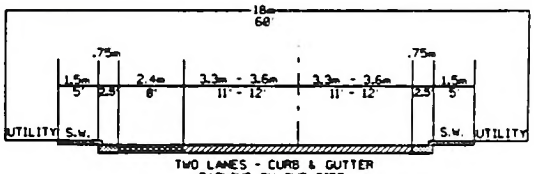
THREE LANES - CURB & GUTTER

I.



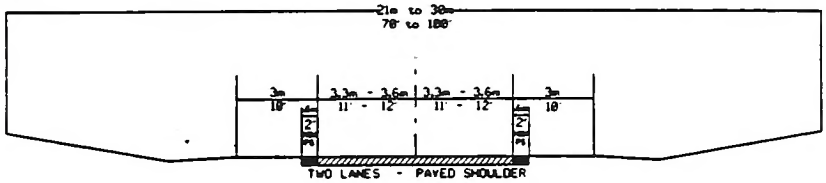
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

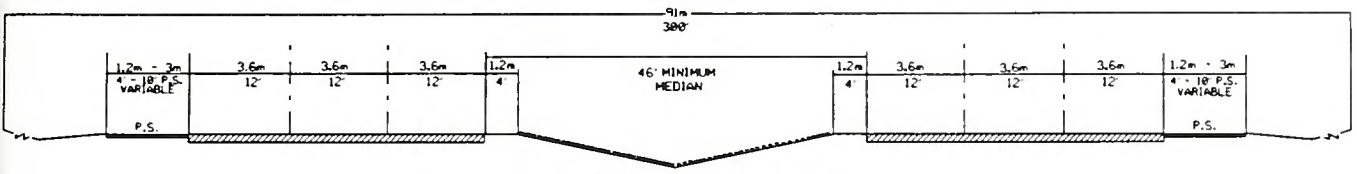
K.



TWO LANES - PAVED SHOULDER

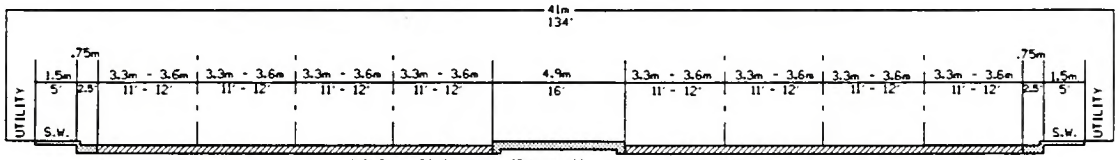
TYPICAL THOROUGHFARE CROSS SECTIONS

L.



SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

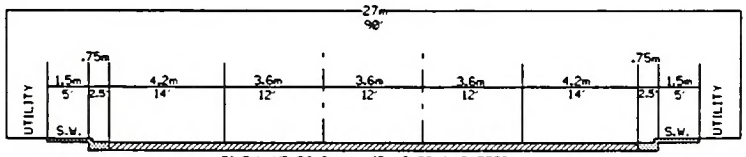
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

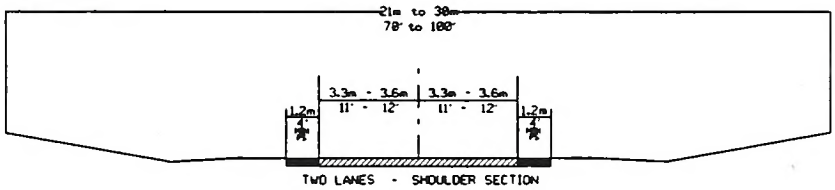
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



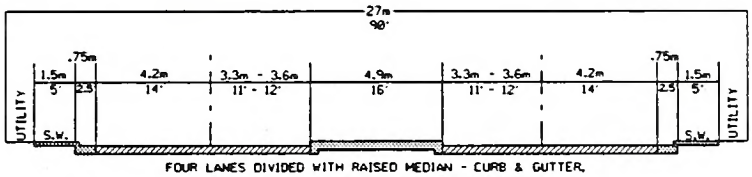
FIVE-LANE ROADWAY WITH CURB & GUTTER.
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER.
STANDARD INSIDE LANES & WIDENED CURB LANES

TABLE A1
CLINTON
THOROUGHFARE PLAN STREET TABULATION AND RECOMMENDATIONS

The Street Tabulation and Recommendations on the following pages consist of a listing of roads in the Planning Area, base year and future year traffic volumes, and recommended cross sections for each facility.

Key to abbreviations:

6L	Six lanes
A through P	Refer to thoroughfare cross sections, Figure A-1
ADQ	Adequate existing situation
ADT	Average Daily Traffic, measured in vehicles per day
BRG	Bridge
CAPACITY	Volume of traffic a roadway can handle at Level of Service D
DIST	Distance along section of roadway, measured in meters
E, N, S, W	East, north, south, or west
ECL, NCL, SCL, WCL	Eastern, northern, southern, or western city limits
NPL, EPL, SPL, WPL	Northern, eastern, southern, western planning limits
FT	Feet
MI	Miles
KM	Kilometers (1 KM = .62 Mile)
M	Meters
N/A	Not available
PB	Thoroughfare planning boundary
RDWY	Roadway width, measured in feet
ROW	Right-of-way width, measured in feet
RR XING	Railroad crossing
SR	Secondary road number
ULT	Ultimate
UN	Unpaved roadway
VPD	Vehicles per day

CLINTON STREET INVENTORY

ROAD-SECTION	METRIC DIST KM	RDWY M	ROW M	ENGLISH DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ROW (ULT)
US 421													
NPL-1 MI N OF INDUSTRIAL	1.7	7.3	46	1.0	24	150	(35700)	11600	17000	F	ADQ	F	ADQ
TO 701	3.7	14.6	46	2.3	48	150	30000	11800	8000	ADQ	ADQ	ADQ	ADQ
701-SPL	1.6	14.6	46	1.0	48	150	27600	7000	10000	ADQ	ADQ	ADQ	ADQ
US 701 BUS													
NPL-.5 MI N SR1818	1.9	7.3	46	1.2	24	150	(30000)	7500	14000	C	ADQ	C	ADQ
.5 MI N SR1818-DIXON	1.4	7.3	46	0.9	24	150	(30000)	8100	10600	C	ADQ	C	ADQ
DIXON-SMITH	1.0	19.5	30	0.6	64	100	30000	12400	17200	ADQ	ADQ	ADQ	ADQ
SMITH-NC 403	0.7	19.5	30	0.5	64	100	30000	12200	16000	ADQ	ADQ	ADQ	ADQ
NC 403-NC 24	1.0	19.5	30	0.6	64	100	30000	11200	17500	ADQ	ADQ	ADQ	ADQ
NC 24-RR	0.3	19.5	30	0.2	64	100	30000	14800	14300	ADQ	ADQ	ADQ	ADQ
RR-S BLVD	0.3	19.5	30	0.2	64	100	30000	17400	17100	ADQ	ADQ	ADQ	ADQ
S BLVD-SW BLVD	1.1	19.5	30	0.7	64	100	30000	11000	8700	ADQ	ADQ	ADQ	ADQ
SW BLVD-ROWAN	0.2	7.3	30	0.2	24	100	(30000)	11000	13200	C	ADQ	C	ADQ
ROWAN-SPL	3.3	7.3	18	2.1	24	60	13500	4800	7900	ADQ	ADQ	ADQ	ADQ
US 701 BYP													
701 BUS S-SUNSET	4.5	14.6	98	2.8	48	320	27600	14000	18200	ADQ	ADQ	ADQ	ADQ
SUNSET-701	5.5	14.6	98	3.4	48	320	27600	18100	18900	ADQ	ADQ	ADQ	ADQ
NC 24													
WPL-COHARIE	0.6	7.3	30	0.4	24	100	(35700)	12000	18500	F	46	F	150
COHARIE-AIRPORT	0.6	11.0	30	0.4	36	100	(30000)	17000	25000	C	37	C	120
AIRPORT-701	1.9	19.8	30	1.2	65	100	30000	17600	27000	ADQ	ADQ	ADQ	ADQ
- SEE US 701 BYP - SEE SOUTHWEST BLVD - SEE 701 BUS													
SOUTH EAST BLVD-SR1953	1.4	13.4	N/A	0.9	44	N/A	(27600)	7500	13000	E	34	E	110
SR 1953-EPL	2.3	7.3	18	1.5	24	60	(27600)	6700	13000	E	34	E	110
NC 403	4.5	6.1	18	2.8	20	60	11500	6500	8500	ADQ	30	ADQ	100

KEY TO ABBREVIATIONS ON PAGE A-11

CLINTON STREET INVENTORY

ROAD- SECTION	METRIC DIST KM	METRIC RDWY M	METRIC ROW M	ENGLISH DIST MI	ENGLISH RDWY FT	ENGLISH ROW FT	PRACTICA CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	METRIC (m) ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ENGLISH (ft) ROW (ULT)
AIRPORT (SR 1262)	2.2	6.1	N/A	1.3	20	N/A	11500	2000	3000	6.7	21	22	70
BARRUS													
W. MAIN - ELIZABETH	0.3	22	13	0.2	22	44	10500	1000	2000	ADQ	ADQ	ADQ	70
(NEW) ELIZABETH - JOHN	0.2	---	---	0.1	---	---	(13500)	---	2000	K	21	K	70
BEAMON (SR 1838)													
701BUS-PETERSON	0.5	6.1	18	0.3	20	60	(24400)	6700	10500	13.4	21	44	70
PETERSON-BALSEY	0.9	11.3	15	0.6	37	50	(24400)	13000	25000	13.4	21	44	70
BALSEY-COLLEGE	0.6	9.8	15	0.4	32	50	15000	7000	13000	ADQ	21	ADQ	70
COLLEGE-MORISEY	0.5	6.7	15	0.3	22	50	(24400)	7000	11000	(13.4)	21	(44)	70
BEULAH (SR 1222)	2.6	5.5	18	1.6	18	60	(11500)	900	1500	6.1	ADQ	20	ADQ
BROWN CH (SR 1842)	1.0	5.5	N/A	0.6	18	N/A	(12800)	1500	3500	6.7	21	22	70
BUTLER (SR 1227)	1.2	12.2	18	0.7	40	60	20700	2700	4000	ADQ	ADQ	ADQ	ADQ
BYRD YANCEYBASS (SR 1934)	2.1	5.5	18	1.3	18	60	(11500)	700	1000	6.1	ADQ	20	ADQ
CARTER													
McKOY - END	0.3	9.5	11	0.2	31	36	13500	3000	6500	ADQ	21	ADQ	70
(NEW) McKOY - BARDEN	0.2	---	---	0.1	---	---	(13500)	---	6500	K	21	K	70
(NEW) END - PETERSON	0.6	---	---	0.4	---	---	(13500)	---	1000	K	21	K	70
COLLEGE (SR 1856)													
701- DEVANE	1.1	11.0	16	0.7	36	54	13900	6000	9500	ADQ	ADQ	ADQ	ADQ
DEVANE-VANCE	3.9	6.1	18	2.4	20	60	(20700)	7700	11100	11	ADQ	36	ADQ
DIXON (SR 1749)	3.2	5.5	N/A	2.0	18	N/A	(12800)	3100	5000	6.7	21	22	70
ELIZABETH (SR 1214)													
SPL-INDIAN TOWN	3.9	6.1	18	2.4	20	60	(13500)	4600	8000	K	21	K	70
IND-701 BYP	1.3	6.1	18	0.8	20	60	(24400)	6000	9400	(G)	21	(G)	70
701 BYP-MORISEY	1.0	6.1	13	0.6	20	42	(24400)	2300	3000	(G)	21	(G)	70
MORISEY - LISBON	1.6	6.1	13	1.0	20	42	11500	1000	3300	ADQ	21	ADQ	70
(NEW) LISBON -SAMPSON	0.2	---	---	0.1	---	---	13500	---	1800	K	21	K	70
(NEW) LISBON - COLLEGE	0.2	---	---	0.1	---	---	13500	---	4100	K	21	K	70

KEY TO ABBREVIATIONS ON PAGE A-11

CLINTON STREET INVENTORY

ROAD- SECTION	METRIC DIST KM	RDWY M	ROW M	ENGLISH DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ROW (ULT)
FAYETVILLE (SR 1855)													
SUNSET - CARTER	1.0	6.7	15	0.6	22	50	12800	800	2000	ADQ	21	ADQ	70
FERRELL (CHESTNUT) (SR 1281)													
E BUTLER-MORRISEY	0.6	10.1	21	0.4	33	70	17300	1200	1500	ADQ	ADQ	ADQ	ADQ
MORR-ELIZABETH	0.4	12.2	21	0.2	40	70	20700	5500	5600	ADQ	ADQ	ADQ	ADQ
ELIZ-FAYETVILLE	0.4	12.2	21	0.3	40	70	20700	6300	5300	ADQ	ADQ	ADQ	ADQ
GOV. MOORE (SR 1752)	2.5	5.5	N/A	1.5	18	N/A	(12800)	1100	2000	6.7	21	22	70
HB LEWIS (SR 1751)	4.7	5.5	15	2.9	18	50	(12800)	1700	5400	6.7	21	22	70
HERRING													
WOODLAND - CHESTNUT	0.6	5.8	11	0.4	19	36	11500	600	1000	6.1	21	20	70
INDIAN TOWN (SR 1226)	4.2	5.5	18	2.6	18	60	(12800)	1800	5400	6.7	ADQ	22	70
INDUSTRIAL	2.4	7.3	18	1.5	24	60	13500	3500	2700	ADQ	ADQ	ADQ	ADQ
ISAAC WEEKS (SR 1829)	0.8	5.5	N/A	0.5	18	N/A	(12800)	1100	2800	6.7	21	22	70
JOHN													
LISBON -STETSON	0.5	8.2	11	0.3	27	36	13500	2000	3500	ADQ	21	ADQ	70
(NEW) STETSON - BARRUS	0.2	---	---	0.1	---	---	(13500)	---	3500	K	60	K	70
JOHNSON (SR 1137)													
BEAMON-McKOY	0.7	9.8	15	0.4	32	50	17300	6800	11800	ADQ	ADQ	ADQ	ADQ
McKOY-WILLIAMS	0.3	9.8	15	0.2	32	50	17300	7000	9100	ADQ	ADQ	ADQ	ADQ
LISBON (SR 1231)													
SW BLVD-MORISEY	1.4	11.3	18	0.9	37	60	20700	6000	3800	ADQ	ADQ	ADQ	ADQ
MOR-ELIZABETH	0.5	11.3	13	0.3	37	42	20700	1000	4200	ADQ	18	ADQ	60
ELIZ-MAIN	0.2	6.1	18	0.1	20	60	14000	1000	1700	ADQ	ADQ	ADQ	ADQ

KEY TO ABBREVIATIONS ON PAGE A-11

CLINTON STREET INVENTORY

ROAD- SECTION	EXISTING CROSS-SECTION METRIC DIST KM	RDWY M	ROW M	ENGLISH DIST MI	RDWY FT	ROW FT	PRACTICA CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ROW (ULT)
LOOP													
SAMPSON - McKOY	0.2	11.0	15	0.1	36	50	20700	700	1000	ADQ	21	ADQ	70
(NEW) McKOY - RR	0.3	---	---	0.2	---	---	(13500)	---	4200	K	21	K	70
MATHIS (SR 1918)	1.9	6.1	18	1.2	20	60	(12800)	1400	2000	6.7	ADQ	22	ADQ
McKOY (SR 1839)	2.2	10.1	18	1.4	33	60	13800	4700	7000	ADQ	ADQ	ADQ	ADQ
MORISEY (SR 1275)													
ELIZ-STETSON	0.4	5.5	21	0.2	18	70	(13500)	1900	12500	K	21	K	70
STET-WARSAW	1.2	11.3	21	0.7	37	70	15000	7200	11700	ADQ	ADQ	ADQ	ADQ
NORTH BLVD (SR 1311)													
BEAMON-701	0.7	6.7	24	0.4	22	80	(30000)	9900	6700	C	27	C	90
701-PRISON	0.6	6.7	24	0.4	22	80	11500	8000	3500	ADQ	ADQ	ADQ	ADQ
PRISON-WPL	3.1	6.7	18	2.0	22	60	11500	2000	3500	ADQ	ADQ	ADQ	80
OLD WARSAW (SR 1919)	2.9	5.5	18	1.8	18	60	(12800)	1800	2700	6.7	ADQ	22	ADQ
OUTER LOOP													
(NEW) US 701 BUS - INDUST.	1.0	---	---	0.6	---	---	(13500)	---	8300	K	21	K	70
(NEW) INDUSTRIAL - NC 24	3.2	---	---	2.0	---	---	(13500)	---	6000	K	21	K	70
(NEW) W MAIN - ELIZABETH	1.5	---	---	0.9	---	---	(13500)	---	2000	K	21	K	70
(NEW) INDIANTOWN - HB LEWIS	5.0	---	---	3.1	---	---	(13500)	---	5600	K	21	K	70
(NEW) HB LEWIS - US 701 BUS	1.9	---	---	1.2	---	---	(13500)	---	6500	K	21	K	70
OVERLAND (SR 1229)	1.6	6.1	18	1.0	20	60	(12800)	1300	3000	6.7	ADQ	22	ADQ
PETERSON (SR 1219)	0.4	5.8	12	0.3	19	40	(13500)	4000	8500	K	21	K	70
PUGH (SR 1751)	1.4	6.1	18	0.8	20	60	(12800)	4500	3100	6.7	ADQ	22	ADQ
RACKEY (SR 1922)	2.3	5.5	18	1.4	18	60	(12800)	1600	2000	6.7	ADQ	22	ADQ
RAILROAD (SR 1232)													
24-701	1.2	5.5	9	0.7	18	30	(12800)	2100	2700	6.7	21	22	70
701-ELIZABETH	0.9	5.5	9	0.6	18	30	(12800)	1300	1000	6.7	21	22	70

KEY TO ABBREVIATIONS ON PAGE A-11

CLINTON STREET INVENTORY

ROAD - SECTION	EXISTING CROSS-SECTION METRIC DIST KM	RDWY M	ROW M	ENGLISH DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ROW (ULT)
RALEIGH (SR 1753)													
701 BUS-KIMBROUGH	0.8	5.5	13	0.5	18	42	(13500)	1800	2200	(9.8)	30	(32)	100
KIMBROUGH-FAIRFAX	0.2	5.5	27	0.1	18	90	(13500)	800	1000	(9.8)	30	(32)	100
FAIRFAX-SR 1751	2.1	5.5	18	1.3	18	60	(13500)	650	1000	(9.8)	30	(32)	100
REEDSFORD (SR 1932)	2.6	5.5	N/A	1.6	18	N/A	(12800)	1500	2800	6.7	21	22	70
ROWAN (SR 1924)													
EPL-REEDSFORD	2.4	6.7	18	1.5	22	60	12800	2000	5500	ADQ	ADQ	ADQ	ADQ
REEDS-701BUS	1.1	6.7	18	0.7	22	60	12800	5700	8500	ADQ	ADQ	ADQ	ADQ
SAMPSON (SR 1854)													
VANCE-BONEY	1.2	9.8	15	0.8	32	50	12500	1200	1000	ADQ	21	ADQ	70
BONEY-McKOY	0.4	5.5	10	0.3	18	33	(11500)	900	1000	6.1	21	20	70
SOUTH BLVD (NC 24)													
701 BYP 1.0 MI	0.5	7.3	30	0.3	24	100	(35700)	10000	11000	(F)	34	(F)	110
1.0 MI TO 701 BUS	1.5	7.3	30	0.9	24	100	(35700)	8500	9000	(F)	34	(F)	110
SOUTHWEST BLVD (SR 1276)													
701BUS-LISBON	0.5	6.7	30	0.3	22	100	12700	4800	6500	ADQ	ADQ	ADQ	ADQ
LISBON-S.BLVD	0.9	6.7	30	0.6	22	100	12700	3500	3000	ADQ	ADQ	ADQ	ADQ
STEWART	1.3	6.1	18	0.8	20	60	(12800)	1000	2500	6.7	ADQ	22	ADQ
SUNSET (SR 1296)													
701BYP-FINCH	0.7	13.4	18	0.4	44	60	27600	11500	22000	ADQ	ADQ	ADQ	ADQ
FINCH-CHURCH	0.1	11.0	18	0.1	36	60	20700	11700	14000	ADQ	ADQ	ADQ	ADQ
CHURCH-McKOY	0.3	11.0	18	0.2	36	60	20700	4000	5000	ADQ	ADQ	ADQ	ADQ
TRAM (SR 1227)	1.1	6.7	18	0.7	22	60	12800	2700	4500	ADQ	ADQ	ADQ	ADQ

KEY TO ABBREVIATIONS ON PAGE A-11

CLINTON STREET INVENTORY

ROAD- SECTION	EXISTING CROSS-SECTION METRIC DIST KM	RDWY M	ROW M	ENGLISH DIST MI	RDWY FT	ROW FT	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADT VPD	2020 ADT VPD	RECOMMENDED CROSS-SECTION METRIC (m) RDWY (ULT)	ROW (ULT)	ENGLISH (ft) RDWY (ULT)	ROW (ULT)
VANCE													
McKOY - SAMPSON	0.2	14.9	15	0.1	49	50	26600	3100	4000	ADQ	21	ADQ	70
WARSAW (SR 1855)													
701BUS-MORISEY	0.4	13.7	18	0.2	45	60	26600	6300	12900	ADQ	ADQ	ADQ	ADQ
MORISEY-COLLEGE	0.6	13.1	18	0.4	43	60	26600	900	2000	ADQ	ADQ	ADQ	ADQ
WEST MAIN													
CHESNUTT-WOODLAND	0.5	6.1	12	0.3	20	40	(13500)	1800	3800	K	21	K	70
WOODLAND-NC 24	0.5	6.1	18	0.3	20	60	(13500)	1800	3300	K	ADQ	K	70
NC 24 - AIRPORT	3.1	6.1	15	1.9	20	50	(13500)	1800	3300	K	21	K	70
WESTOVER (SR 1289)													
NC 24 - SHOP CTR ENTRANCE	0.3	9.1	18	0.2	30	60	17300	3000	3900	ADQ	ADQ	ADQ	ADQ
ENTRANCE - TRAM	2.5	6.7	18	1.5	22	60	12700	2600	3500	ADQ	ADQ	ADQ	ADQ
WILLIAMS	0.2	7.3	12	0.1	24	40	13500	5700	9100	ADQ	21	ADQ	70
WOODLAND	1.1	6.1	15	0.7	20	50	11500	5500	7000	ADQ	ADQ	ADQ	ADQ

KEY TO ABBREVIATIONS ON PAGE A-11

Appendix B

RECOMMENDED SUBDIVISION ORDINANCES

Note: English equivalents are printed in this report merely as a guide. The English measurements were not meant to represent exact conversions, and should not be used for standards, regulations, or construction. The tables in this section were taken from the Roadway Design Metric Design Manual. In the event of conflicting information, the Standard Specifications for Roads and Structures and the Roadway Design Metric Design Manual should serve as the standard.

Appendix B

RECOMMENDED SUBDIVISION ORDINANCES

DEFINITIONS

I. Streets and Roads

A. Rural Roads

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.

3. Major Collector - A road which serves major intra-county travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.

5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Inter-state, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through traffic movements and may also serve abutting property.

3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. An expressway is a facility with full or partial control of access and generally with grade separations at major intersections. A parkway is for non-commercial traffic, with full or partial control of access.

2. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 760 meters (2500 ft) in length, or streets less than 1.6 kilometers (1.0 miles) in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides of develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than 4 hectares (10 acres) where no street right-of-way dedication is involved, (3) the public acquisition, by purchase, of strips of land for the widening or the opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than 0.8 hectares (2 acres) into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

D. Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within the Planning Area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the municipality.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

A. Right-of-way Widths - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

	Min. ROW	
1. Rural		
a. Principle Arterial		
Freeways	105 m	(350 ft)
Other	60 m	(200 ft)
b. Minor Arterial	30 m	(100 ft)
c. Major Collector	30 m	(100 ft)
d. Minor Collector	24 m	(80 ft)
e. Local Road	18 m[1]	(60 ft)
2. Urban		
a. Major Thoroughfare other than Freeway and Expressway	27 m	(90 ft)
b. Minor Thoroughfare	21 m	(70 ft)
c. Local Street	18 m[1]	(60 ft)
d. Cul-de-sac	Variable[2]	

The subdivider will only be required to dedicate a maximum of 30 meters (100 ft) of right-of-way. In cases where over 30 meters (100 ft) of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 30 meters (100 ft). On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than 18 meters (60 ft) in width, may be dedicated when

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[1] The desirable minimum right-of-way (ROW) is 18 meters (60 ft). If curb and gutter is provided, 15 meters (50 ft) of ROW is adequate on local residential streets.

[2] The ROW dimension will depend on radius used for vehicular turn around. Distance from edge of pavement of turn around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn around.

adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is sub-divided, the remainder of the full required right-of-way shall be dedicated.

B. Street Widths - Widths for street and road classifications other than local shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential
   Curb and Gutter section: 7.8 meters (26 ft), face to face of curb
   Shoulder section: 6.0 meters (20 ft) to edge of pavement, 1.2 meters (4 ft) for shoulders

2. Residential Collector
   Curb and Gutter section: 10.2 meters (34 ft), face to face of curb
   Shoulder section: 6.0 meters (20 ft) to edge of pavement, 1.8 meters (6 ft) for shoulders

C. Geometric Characteristics - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed - The design speed for a roadway should be a minimum of 10 km/h (5 mph) greater than the posted speed limit. The design speeds for subdivision type streets shall be:

DESIGN SPEEDS (METRIC)			
Facility Type	Design Speed km/h Desirable	Minimum Level	Rolling
RURAL			
Minor Collector Roads (ADT Over 2000)	100	80	60
Local roads including Residential Collectors and Local Residential (ADT Over 400)	80	80	60
URBAN			
Major Thoroughfares other than Freeway or Expressway	100	60	60
Minor Thoroughfares	100	50	50
Local Streets	50	50	30

DESIGN SPEEDS (ENGLISH)			
Facility Type	Design Speed mph Desirable	Minimum Level	Rolling
RURAL			
Minor Collector Roads (ADT Over 2000)	60	50	40
Local roads including Residential Collectors and Local Residential (ADT Over 400)	50	* 50	* 40
URBAN			
Major Thoroughfares other than Freeway or Expressway	60	50	40
Minor Thoroughfares	40	30	30
Local Streets	30	**30	**20

* Based on ADT of 400-750. Where roads serve a limited area and small number of units, can reduce min design speed.

**Based on projected ADT of 50-250.
(Reference NCDOT Metric Design Manual page 1-1B)

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

MAXIMUM VERTICAL GRADE (METRIC)				
Facility Type	Design Speed (km/h)	Maximum Grade (Percent) Flat	Rolling	Mountainous
RURAL				
Minor Collector Roads*	30	7	10	12
	50	7	9	10
	65	7	8	10
	80	6	7	9
	100	5	6	8
	110	4	5	6
Local roads including Residential Collectors and Local Residential Streets*	30	-	11	16
	50	7	10	14
	65	7	9	12
	80	6	8	10
	100	5	6	-
URBAN				
Major Thoroughfares other than Freeway or Expressway	50	8	9	11
	65	7	8	10
	80	6	7	9
	100	5	6	8
Minor Thoroughfares*	30	9	12	14
	50	9	11	12
	65	9	10	12
	80	7	8	10
	100	6	7	9
	110	5	6	7
Local Streets*	30	-	11	16
	50	7	10	14
	65	7	9	12
	80	6	8	10
	100	5	6	-

* For streets and roads with projected annual average daily traffic less than 250 or short grades less than 150 meters (500 ft) long, grades may be 2% steeper than the values in the above table.

(Reference NCDOT Metric Design Manual page 1-12 T-3)

MAXIMUM VERTICAL GRADE (ENGLISH)				
Facility Type	Design Speed (mph)	Maximum Grade (Percent) Flat	Rolling	Mountainous
RURAL				
Minor Collector Roads*	20	7	10	12
	30	7	9	10
	40	7	8	10
	50	6	7	9
	60	5	6	8
	70	4	5	6
Local roads including Residential Collectors and Local Residential Streets*	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-
URBAN				
Major Thoroughfares other than Freeway or Expressway	30	8	9	11
	40	7	8	10
	50	6	7	9
	60	5	6	8
Minor Thoroughfares*	20	9	12	14
	30	9	11	12
	40	9	10	12
	50	7	8	10
	60	6	7	9
	70	5	6	7
Local Streets*	20	-	11	16
	30	7	10	14
	40	7	9	12
	50	6	8	10
	60	5	6	-

b. Minimum grade should not be less than 0.5% .

c. Grades for 30 meters (100 ft) each way from intersections (measured from edge of pavement) should not exceed 5%.

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* For streets and roads with projected annual average daily traffic less than 250 or short grades less than 150 meters (500 ft) long, grades may be 2% steeper than the values in the above table.

(Reference NCDOT Metric Design Manual page 1-12 T-3)

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

SIGHT DISTANCE (METRIC)					
Design Speed (km/h)	30	50	60	90	100
Stopping Sight Distance					
Minimum (meters)	29.6	57.4	74.3	131.2	157.0
Desirable (meters)	30	70	90	170	210
Minimum K* Value for:					
Crest curve	3	9	14	43	62
Sag curve	4	11	15	30	37
Passing Sight Distance:					
Minimum Passing Dist for two lanes, in m	*	*	*	*	*

(General practice calls for vertical curves to be multiples of 10 meters. Calculated lengths shall be rounded up in each case.)
* Currently under revision.
(Reference NCDOT Metric Metric Design Manual page 1-12 T-1)

SIGHT DISTANCE (ENGLISH)				
Design Speed, MPH	30	40	50	60
Stopping Sight Distance:				
Minimum (ft.)	200	275	400	525
Desirable (ft.)	200	325	475	650
Minimum K* Value for:				
Crest Curve	30	60	110	190
Sag Curve	40	60	90	120
Passing Sight Distance:				
Minimum Passing Distance for 2 lanes, in feet	1,100	1,500	1,800	2,100

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)
(Reference NCDOT Metric Design Manual page 1-12 T-1)

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* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length of the vertical curve which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990".

4. The "Superelevation Table" shown below shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

SUPERELEVATION TABLE (METRIC)		
Design Speed	Maximum e*	Minimum Radius m
50 km/h	0.04	100
65	0.04	175
80	0.04	280
100	0.04	490
50	0.06	90
65	0.06	160
80	0.06	250
100	0.06	435
50	0.08	80
65	0.08	145
80	0.08	230
100	0.08	395

e = rate of roadway superelevation, meter per meter

SUPERELEVATION TABLE (ENGLISH)			
Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve
30 mph	0.04	302	19 00′
40	0.04	573	10 00′
50	0.04	955	6 00′
60	0.04	1,637	3 45′
30	0.06	273	21 00′
40	0.06	521	11 15′
50	0.06	955	6 45
60	0.06	1,432	4 15′
30	0.08	260	22 45′
40	0.08	477	12 15′
50	0.08	819	7 30′
60	0.08	1,146	4 45′

* e = rate of roadway superelevation, foot per foot

(Reference NCDOT Metric Design Manual page 1-12 T-6 thru T-8)

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 60 meters (200 ft) between survey center lines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than 150 meters (500 ft) in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least 6.0 meters (20 ft).

3. Dead end alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around facilities at the dead end as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is

available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 9.0 meters (30 ft) from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 1.8 meters (6 ft) from the face of curb.

I. Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

a. Shoulder section approach

i. Under 800 ADT design year

Minimum 8.4 meters (28 ft) width face to face of parapets, rails, or pavement width plus 3.0 meters (10 ft), whichever is greater.

ii. 800 - 2000 ADT design year

Minimum 10.2 meters (34 ft) width face to face of parapets, rails, or pavement width plus 3.6 meters (12 ft), whichever is greater.

iii. Over 2000 ADT design year

Minimum width of 12 meters (40 ft), desirable width of 13.2 meters (44 ft) width face to face of parapets or rails.

b. Curb and gutter approach

i. Under 800 ADT design year

Minimum 7.2 meters (24 ft) face to face of curbs.

ii. Over 800 ADT design year

Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be a minimum of 450 millimeters (1' 6"), or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

   a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 2.4 m (8 ft) minimum, 3.0 m (10 ft) desirable.)

   b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

APPENDIX C - CALIBRATION DATA

For this model, the planning area was divided into 91 traffic analysis zones. An inventory of dwellings, employment, and commercial vehicles was taken for each of the zones. Trip productions for each zone were calculated by categorizing dwelling units by trip making ability, and adding in commercial vehicles garaged in the zone. The following dwelling unit groups and corresponding generation rates were used for the Clinton Base Model.

Grouping	**1994 Generation Rate**
Excellent	12.0
Above Average	11.0
Average	9.0
Below Average	7.0
Poor	5.0
Truck	5.0
Taxi	6.7

(Note: Average persons/DU 1994 assumed to be 2.6)

The model predicts travel between zones for three types of trips. Internal trips are trips with both origin and destination inside the planning area. Internal-external trips has one end within, and one end outside the planning area. The third type, through trips, pass through the planning area, but have both ends outside the area.

Zonal trips were broken into three categories: home based work trips (HBW), other home based trips (OHB), and non-home based trips (NHB). The following percentages were used for the Clinton Model.

CATEGORY	**PERCENT**
HBW OF INTERNAL	25.0%
OHB OF INTERNAL	48.0%
NHB OF INTERNAL	27.0%
(INTERNAL OF TOTAL)	85.0%

There are also NHB trips which are made by vehicles garaged outside the planning area, but having both origin and destination inside. These secondary non-home based trips (NHBS) were calculated by the following formula:

NHBS = (Total EI - EI gar in PA) * F

Total EI = Total External-Internal trips
EI Garaged In Planning Area = Total Trips - 85% Total Trips
(85% Comes from % Internal of Total)
F = Factor based on in-commuting, for the Clinton Model, this factor was chosen to be 0.6 .

Trip attraction for each type of trip was based on regression equations relating to employment type. The following Trip Attraction Regression Equations were used for the Clinton Model:

Home Based Work

$$Y = C + 1.00X_1 + 1.00X_2 + 1.00X_3 + 1.00X_4 + 1.00X_5 + 1.00X_6 + 1.00X_7 + 1.00X_8$$

Other Home Based, Non-home Based and External-Internal

$$Y = C + 0.50X_1 + 1.83X_2 + 8.36X_3 + 2.60X_4 + 2.55X_5 + 0.50X_6 + 15.0X_7 + 9.00X_8$$

Y = Attraction Factor
C = Constant determined by regression Analysis
X1 = Industrial Employment SIC # 1-49
X2 = Retail and Wholesale Employment SIC # 50-54,56,57,59
X3 = Highway Retail Employment SIC # 55, 58
X4 = Office Employment SIC # 60-67, 91-97
X5 = Service Employment SIC # 70-76, 78-89, 99
X6 = Special Attraction Factor (Industrial Park)
X7 = Special Attraction Factor (Golf Course)
X8 = Special Attraction Factor (Downtown)

The special attraction factor in category X6 was used to increase the attractiveness of the industrial park. The X7 category was created to attract more traffic to the zone containing the golf course and Country Club. X8 was created to attract trips to the downtown section. Attraction factors for each trip purpose were adjusted so that total attractions would equal total productions.

The Gravity Model was used to distribute trips throughout the network. The Gravity Model is based on the concept that Trips form i to j equal the trips produced at zone i times the ratio of the attractiveness of zone j to the attractiveness of all zones.

Once the model distributed trips across the network, these assigned volumes were compared to actual ground counts. Screenlines were used to check the traffic. Screenlines are imaginary lines that cross the planning area. Counts were taken at every street that crosses the screenline. The screenline counts are then compared to the volume generated by the model.

CLINTON SCREENLINE TOTALS

SCREENLINE	ACTUAL COUNT	MODEL VOLUME	DIFFERENCE
1 (NORTH - SOUTH)	57510	60048	.96
2 (EAST - WEST)	53046	54948	.97

CLINTON MODEL INPUT VARIABLES

YEAR	EXC	AAV	AVG	BAVG	POOR	OVERALL AVG
1994	12.0	11.0	9.0	7.0	5.0	8.36
2020	12.2	11.2	9.2	7.2	5.2	8.54

INCREASE = (AVG 1994 TRIP RATE * COMPOSITE FACTOR) -
AVG 1994 TRIP RATE

WHERE THE COMPOSITE FACTOR EQUALS:

$$\frac{\text{1994 PERSONS/VEHICLE}}{\text{2020 PERSONS/VEHICLE}} * \text{USAGE FACTOR} * \frac{\text{2020 PERSONS/DU}}{\text{1994 PERSONS/DU}}$$

NOTE: USAGE FACTOR CHOSEN TO BE 0.95
1994 PERSONS/DU = 2.6
2020 PERSONS/DU = 2.4

Using this formula, an increase in generation rates of 0.17 was calculated.

APPENDIX D - 1995 EMPLOYMENT BY TYPE

Internal Data Summary
BASE YEAR 1995

X1 = Industrial Employment SIC # 1-49
X2 = Retail and Wholesale Employment SIC # 50-54, 56, 57, 59
X3 = Highway Retail Employment SIC # 55, 58
X4 = Office Employment SIC # 60-67, 91-97
X5 = Service Employment SIC # 70-76, 78-89, 99
X6 = Special Attraction Factor (Industrial Park)
X7 = Special Attraction Factor (Golf Course)
X8 = Special Attraction Factor (Downtown)
TEMP (Total Employment) Includes only X1 - X7

ZONE	X1	X2	X3	X4	X5	X6	X7	X8	TEMP
1	2	50	10	82	61	0	0	143	205
2	107	52	5	62	53	0	0	115	279
3	20	52	13	75	107	0	0	0	267
4	53	19	4	12	79	0	0	0	167
5	0	0	0	0	0	0	0	0	0
6	77	0	0	0	8	0	0	0	85
7	0	0	0	0	3	0	0	0	3
8	0	1	3	0	45	0	0	0	49
9	2	30	0	19	49	0	0	0	100
10	0	17	0	3	59	0	0	0	79
11	0	22	0	17	63	0	0	80	102
12	0	0	0	0	70	0	0	0	70
13	0	0	0	0	0	0	0	0	0
14	0	0	0	0	4	0	0	0	4
15	8	98	3	0	8	0	0	0	117
16	0	0	0	0	7	0	0	0	7
17	0	0	12	291	12	0	0	0	315
18	16	11	9	2	970	0	0	0	1008
19	0	50	35	7	16	0	0	50	108
20	4	33	64	2	39	0	0	97	142
21	24	26	0	5	18	0	0	26	73
22	8	9	0	1	80	0	0	50	98
23	0	0	0	0	505	0	0	200	505
24	0	0	0	0	10	0	0	0	10
25	0	0	0	0	35	0	0	0	35
26	0	0	46	0	12	0	0	0	58
27	3	164	54	17	12	0	0	218	250
28	50	0	0	0	0	0	0	0	50
29	97	41	0	0	58	0	0	0	196
30	0	4	0	0	1	0	0	0	5
31	32	53	33	2	16	0	0	0	136
32	402	14	8	4	0	0	0	0	428
33	78	16	40	1	31	0	0	56	166
34	44	11	10	1	6	0	0	0	72
35	2	5	0	23	16	0	0	5	46
36	0	141	75	36	71	0	0	141	323

ZONE	X1	X2	X3	X4	X5	X6	X7	X8	TEMP
37	0	0	0	24	90	0	0	0	114
38	0	0	0	7	16	0	0	0	23
39	7	0	0	0	124	0	0	0	131
40	0	0	0	0	3	0	0	0	3
41	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0
43	0	2	0	2	18	0	0	0	22
44	10	0	0	0	2	0	0	0	12
45	0	0	25	5	40	0	0	0	70
46	50	0	0	0	0	0	0	0	50
47	12	0	0	0	11	0	0	0	23
48	3	0	0	0	2	0	0	0	5
49	0	0	0	0	1	0	0	0	1
50	27	12	0	0	315	0	0	0	354
51	3	2	8	25	19	0	0	0	57
52	0	0	0	0	13	0	0	0	13
53	148	138	15	8	5	0	0	143	314
54	4	2	0	0	3	0	0	0	9
55	0	0	0	0	0	0	0	0	0
56	0	0	0	0	1	0	0	0	1
57	0	0	0	0	0	0	0	0	0
58	0	0	0	0	9	0	0	0	9
59	0	19	11	4	53	0	0	0	87
60	3	69	54	23	19	0	0	0	168
61	580	0	0	0	0	580	0	0	1160
62	130	5	6	18	0	130	0	0	289
63	0	0	0	140	0	0	0	0	140
64	0	3	4	134	1	0	0	0	142
65	314	0	0	0	28	0	0	0	342
66	27	0	8	0	10	0	0	0	45
67	0	0	0	0	21	0	12	5	33
68	13	25	11	4	12	0	0	0	65
69	0	0	0	0	4	0	0	0	4
70	0	17	55	8	163	0	0	0	243
71	0	0	0	0	0	0	0	0	0
72	7	0	0	2	0	0	0	0	9
73	7	2	0	0	3	0	0	0	12
74	0	0	0	0	75	0	0	75	75
75	0	0	0	0	17	0	0	0	17
76	0	0	0	0	0	0	0	0	0
77	0	0	0	0	2	0	0	0	2
78	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0
80	68	0	0	0	1	0	0	0	69
81	21	0	0	0	0	0	0	0	21
82	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0
84	0	0	9	0	1	0	0	0	10
85	0	0	0	0	3	0	0	0	3
86	5	41	3	2	66	0	0	0	117
87	3	0	14	0	0	0	0	0	17
88	0	0	0	0	0	0	0	0	0

ZONE	X1	X2	X3	X4	X5	X6	X7	X8	TEMP
89	15	8	0	0	0	0	0	0	23
90	70	0	0	0	0	0	0	0	70
91	5	4	0	0	5	0	0	0	14
92	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0
	2561	1268	647	1068	3680	710	12	1404	9946

APPENDIX E - DWELLING UNITS

Internal Data Summary
BASE YEAR 1995

ZN = Zone Number
EXC = Excellent Dwelling Units
AAV = Above Average Dwelling Units
AVE = Average
BA = Below Average
POOR = Poor
SP = Special Use Category
GHU = Group Housing Units
TAXI = Number of Taxis Garaged in Zone
TRUCKS = Number of Commercial Trucks Garaged in Zone
CA = Number of Commercial Autos Garaged in Zone

ZN	EXC	AAV	AVE	BA	POOR	SP	GHU	TAXI	TRUCK	CA
1	0	0	0	0	4	0	0	0	3	10
2	0	0	10	8	0	0	0	0	3	16
3	0	0	74	10	7	0	0	0	13	23
4	0	0	0	0	0	0	0	0	67	2
5	0	1	99	9	1	0	0	0	0	0
6	0	0	55	7	9	0	0	0	6	0
7	0	0	77	14	0	0	0	0	0	0
8	0	0	48	4	1	0	0	0	0	0
9	0	0	25	1	0	0	0	0	1	1
10	0	0	57	11	7	0	0	0	3	0
11	0	0	41	8	11	0	0	0	2	13
12	0	0	17	4	0	0	0	0	0	0
13	0	4	21	0	0	0	0	0	0	0
14	0	4	54	2	1	0	0	0	0	0
15	0	0	2	1	0	0	0	0	6	1
16	0	0	89	19	4	0	0	0	0	0
17	0	2	8	2	2	0	0	0	5	0
18	0	0	5	1	0	0	0	0	25	1
19	0	0	31	16	4	0	0	0	6	3
20	0	0	85	31	10	0	0	0	4	9
21	0	0	81	12	1	0	0	0	10	0
22	0	0	85	20	1	0	0	0	0	0
23	0	1	23	0	0	0	0	0	0	2
24	0	0	103	5	1	0	0	0	0	0
25	0	0	127	14	3	0	0	0	0	0
26	0	0	154	40	11	0	0	0	1	1
27	0	0	0	0	0	0	0	0	9	1
28	0	0	21	6	3	0	0	0	17	0
29	0	0	54	16	20	0	0	0	6	1
30	0	0	39	10	0	0	0	0	0	0
31	0	0	5	4	5	0	0	0	32	3
32	0	0	0	9	7	0	0	0	12	2
33	0	0	13	10	2	0	0	0	38	0
34	0	0	0	8	3	0	0	0	5	1
35	0	20	279	3	2	0	0	0	9	0

ZN	EXC	AAV	AVE	BA	POOR	SP	GHU	TAXI	TRUCK	CA
36	0	0	70	4	2	0	0	0	7	5
37	0	0	55	5	0	0	0	0	0	0
38	1	3	42	6	3	0	0	0	0	0
39	0	0	43	3	1	0	0	0	0	0
40	0	0	104	26	8	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0
42	0	5	42	0	0	0	0	0	0	0
43	0	0	86	83	21	0	0	0	0	0
44	0	0	0	0	0	0	0	0	2	1
45	0	0	2	43	0	0	0	0	7	2
46	0	0	22	41	13	0	0	0	6	0
47	0	0	108	29	2	0	0	0	15	2
48	0	0	75	1	0	0	0	0	6	0
49	0	0	10	15	3	0	0	0	1	0
50	0	0	54	6	2	0	0	0	7	3
51	0	0	57	13	0	0	0	0	24	4
52	0	0	11	8	20	0	0	0	7	0
53	0	0	6	30	24	0	0	0	29	9
54	0	0	1	3	1	0	0	0	4	0
55	0	0	28	11	2	0	0	0	0	0
56	0	2	14	2	0	0	0	0	0	0
57	0	0	13	5	4	0	0	0	0	0
58	0	0	35	7	0	0	0	0	5	0
59	0	0	2	2	0	0	0	0	9	7
60	0	0	35	22	4	0	0	0	40	2
61	0	0	0	2	5	0	0	0	1	0
62	0	0	1	4	0	0	0	0	12	5
63	0	0	0	0	0	0	0	0	72	3
64	0	0	8	5	0	0	0	0	12	14
65	0	0	87	13	1	0	0	0	1	2
66	0	0	31	34	3	0	0	0	6	2
67	20	53	111	0	0	0	0	0	0	0
68	0	3	5	2	0	0	0	0	10	0
69	0	1	9	36	0	0	0	0	0	0
70	0	0	3	0	0	0	0	0	4	1
71	9	31	35	0	0	0	0	0	0	0
72	0	5	22	7	3	0	0	0	1	0
73	0	12	40	68	1	0	0	0	3	0
74	0	0	0	0	0	0	0	0	0	0
75	0	1	24	77	8	0	0	0	3	3
76	0	1	15	28	2	0	0	0	0	0
77	1	3	16	15	2	0	0	0	0	0
78	0	0	24	18	5	0	0	0	0	0
79	0	1	23	49	10	0	0	0	0	0
80	0	1	7	11	1	0	0	0	13	0
81	0	2	20	18	2	0	0	0	6	0
82	0	0	2	2	0	0	0	0	0	0
83	0	0	7	1	1	0	0	0	0	0
84	0	0	22	9	1	0	0	0	0	0
85	0	2	37	66	4	0	0	0	0	0
86	0	0	28	63	2	0	0	0	6	0
87	0	0	9	31	1	0	0	0	3	0
88	0	3	35	5	0	0	0	0	0	0

ZN	EXC	AAV	AVE	BA	POOR	SP	GHU	TAXI	TRUCK	CA
89	0	3	22	5	0	0	0	0	1	0
90	0	1	38	16	2	0	0	0	8	7
91	0	0	22	30	4	0	0	0	2	0
92	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0
	31	165	3400	1285	288	0	0	0	616	162

APPENDIX F - 2020 EMPLOYMENT BY TYPE

Internal Data Summary
PLAN YEAR 2020

X1 = Industrial Employment SIC # 1-49
X2 = Retail and Wholesale Employment SIC # 50-54, 56, 57, 59
X3 = Highway Retail Employment SIC # 55, 58
X4 = Office Employment SIC # 60-67, 91-97
X5 = Service Employment SIC # 70-76, 78-89, 99
X6 = Special Attraction Factor (Industrial Park)
X7 = Special Attraction Factor (Golf Course)
X8 = Special Attraction Factor (Downtown)
TEMP (Total Employment) Includes only X1 - X7

ZN	X1	X2	X3	X4	X5	X6	X7	X8	X9	TEMP
1	2	50	10	107	61	0	0	168	0	230
2	107	52	5	87	53	0	0	140	0	304
3	20	52	13	125	132	0	0	0	0	342
4	53	19	4	37	79	0	0	0	0	192
5	0	0	0	15	0	0	0	0	0	15
6	77	0	0	0	8	0	0	0	0	85
7	0	0	0	0	3	0	0	0	0	3
8	0	1	3	0	45	0	0	0	0	49
9	2	30	0	19	49	0	0	0	0	100
10	0	17	0	3	114	0	0	0	0	134
11	0	22	0	17	63	0	0	80	0	102
12	0	0	10	0	85	0	0	0	0	95
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	4	0	0	0	0	4
15	8	98	3	0	8	0	0	0	0	117
16	0	0	0	0	7	0	0	0	0	7
17	0	0	12	391	12	0	0	0	0	415
18	16	11	9	2	970	0	0	0	0	1008
19	0	50	35	7	16	0	0	50	0	108
20	4	33	64	2	39	0	0	97	0	142
21	24	26	0	5	18	0	0	26	0	73
22	8	9	0	1	355	0	0	100	0	373
23	0	0	0	0	930	0	0	300	0	930
24	0	0	0	0	10	0	0	0	0	10
25	0	0	5	0	135	0	0	0	0	140
26	0	0	66	0	12	0	0	0	0	78
27	3	164	64	17	12	0	0	228	0	260
28	90	25	0	0	0	0	0	0	0	115
29	108	41	0	0	58	0	0	0	0	207
30	0	4	0	0	1	0	0	0	0	5
31	32	53	33	42	16	0	0	0	0	176
32	502	14	8	24	0	0	0	0	0	548
33	128	16	40	6	31	0	0	56	0	221
34	44	11	10	1	6	0	0	0	0	72
35	2	5	0	23	16	0	0	5	0	46
36	0	176	75	86	71	0	0	176	0	408

ZN	X1	X2	X3	X4	X5	X6	X7	X8	X9	TEMP
37	0	0	0	44	105	0	0	0	0	149
38	0	0	0	7	16	0	0	0	0	23
39	7	0	0	0	252	0	0	0	0	259
40	0	0	0	0	3	0	0	0	0	3
41	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0
43	0	2	0	2	18	0	0	0	0	22
44	10	0	0	0	2	0	0	0	0	12
45	0	0	30	5	40	0	0	0	0	75
46	70	40	25	0	0	0	0	0	0	135
47	12	0	0	0	11	0	0	0	0	23
48	3	0	0	0	2	0	0	0	0	5
49	0	0	0	0	1	0	0	0	0	1
50	27	12	0	0	395	0	0	0	0	434
51	3	2	8	25	19	0	0	0	0	57
52	0	0	6	0	13	0	0	0	0	19
53	238	138	25	8	5	0	0	163	0	414
54	4	2	0	0	3	0	0	0	0	9
55	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	1	0	0	0	0	1
57	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	9	0	0	0	0	9
59	0	49	11	4	68	0	0	0	0	132
60	3	134	54	23	19	0	0	0	0	233
61	655	0	0	0	0	655	0	0	0	1310
62	330	5	6	18	0	330	0	0	0	689
63	0	0	0	140	0	0	0	0	0	140
64	0	3	4	134	1	0	0	0	0	142
65	314	0	10	0	28	0	0	0	0	352
66	27	0	8	0	10	0	0	0	0	45
67	0	71	55	0	21	0	12	5	0	159
68	13	60	36	4	12	0	0	0	0	125
69	0	0	0	0	4	0	0	0	0	4
70	0	17	60	8	263	0	0	0	0	348
71	0	0	0	0	0	0	0	0	0	0
72	7	0	0	2	0	0	0	0	0	9
73	7	2	0	0	3	0	0	0	0	12
74	0	0	0	0	90	0	0	90	0	90
75	0	0	0	0	17	0	0	0	0	17
76	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	2	0	0	0	0	2
78	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0
80	68	0	0	0	1	0	0	0	0	69
81	21	0	0	0	0	0	0	0	0	21
82	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0
84	0	0	9	0	1	0	0	0	0	10
85	0	0	10	0	3	0	0	0	0	13
86	5	86	8	2	101	0	0	0	0	202
87	3	45	19	0	35	0	0	0	0	102
88	0	0	0	0	0	0	0	0	0	0

ZN	X1	X2	X3	X4	X5	X6	X7	X8	X9	TEMP
89	315	48	10	0	0	0	0	0	0	373
90	70	0	0	0	0	0	0	0	0	70
91	5	4	0	0	5	0	0	0	0	14
92	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0
	3447	1699	863	1443	4998	985	12	1684	0	13447

APPENDIX G - 2020 DWELLING UNITS

Internal Data Summary
PLAN YEAR 2020

ZN = Zone Number
EXC = Excellent Dwelling Units
AAV = Above Average Dwelling Units
AVE = Average
BA = Below Average
POOR = Poor
SP = Special Use Category
GHU = Group Housing Units
TAXI = Number of Taxis Garaged in Zone
TRUCKS = Number of Commercial Trucks Garaged in Zone
CA = Number of Commercial Autos Garaged in Zone

ZONE	EXC	AAV	AVE	BA	POOR	GHU	TAXI	TRUCK	CA
1	0	0	0	2	4	0	0	3	10
2	0	0	13	10	0	0	0	3	16
3	0	0	74	10	7	0	0	13	23
4	0	0	0	0	0	0	0	67	2
5	0	2	105	12	1	0	0	0	0
6	0	0	55	7	9	0	0	6	0
7	0	0	77	14	0	0	0	0	0
8	0	0	54	5	1	0	0	0	0
9	0	0	25	1	0	0	0	1	1
10	0	0	57	11	7	0	0	3	0
11	0	0	41	8	11	0	0	2	13
12	0	0	20	5	0	0	0	0	0
13	0	6	24	0	0	0	0	0	0
14	0	4	54	2	1	0	0	0	0
15	0	0	2	1	0	0	0	6	1
16	0	0	105	25	5	0	0	0	0
17	0	2	8	2	2	0	0	5	0
18	0	0	5	1	0	0	0	25	1
19	0	0	31	16	4	0	0	6	3
20	0	0	87	33	10	0	0	4	9
21	0	0	84	15	1	0	0	10	0
22	0	0	85	20	1	0	0	0	0
23	0	1	23	0	0	0	0	0	2
24	0	0	103	6	1	0	0	0	0
25	0	0	127	15	3	0	0	0	0
26	0	0	159	50	11	0	0	1	1
27	0	0	0	0	0	0	0	9	1
28	0	0	25	7	3	0	0	17	0
29	0	0	60	20	20	0	0	6	1
30	0	0	39	10	0	0	0	0	0
31	0	0	5	4	5	0	0	32	3
32	0	0	0	9	7	0	0	12	2
33	0	0	13	10	2	0	0	38	0
34	0	0	0	8	3	0	0	5	1
35	0	23	313	7	2	0	0	9	0
36	0	0	73	5	2	0	0	7	5

ZONE	EXC	AAV	AVE	BA	POOR	GHU	TAXI	TRUCK	CA
37	0	0	58	7	0	0	0	0	0
38	1	3	42	6	3	0	0	0	0
39	0	0	45	4	1	0	0	0	0
40	0	0	117	30	8	0	0	0	0
41	0	0	0	0	0	0	0	0	0
42	0	6	49	0	0	0	0	0	0
43	0	0	90	89	21	0	0	0	0
44	0	0	0	0	0	0	0	2	1
45	0	0	2	43	0	0	0	7	2
46	0	0	30	60	20	0	0	6	0
47	0	10	155	70	5	0	0	15	2
48	0	5	100	5	0	0	0	6	0
49	0	0	16	19	5	0	0	1	0
50	0	0	75	12	3	0	0	7	3
51	0	0	65	15	0	0	0	24	4
52	0	0	13	15	22	0	0	7	0
53	0	0	45	60	35	0	0	29	9
54	0	0	6	12	2	0	0	4	0
55	0	1	30	15	4	0	0	0	0
56	0	3	17	5	0	0	0	0	0
57	0	1	22	8	4	0	0	0	0
58	0	5	50	15	0	0	0	5	0
59	0	0	6	4	0	0	0	9	7
60	0	2	52	50	6	0	0	40	2
61	0	0	0	2	5	0	0	1	0
62	0	0	1	4	0	0	0	12	5
63	0	0	0	0	0	0	0	72	3
64	0	0	8	5	0	0	0	12	14
65	0	4	130	35	1	0	0	1	2
66	0	1	46	40	3	0	0	6	2
67	30	83	127	0	0	0	0	0	0
68	0	3	5	2	0	0	0	10	0
69	0	3	12	45	0	0	0	0	0
70	0	1	4	0	0	0	0	4	1
71	2	60	50	0	0	0	0	0	0
72	0	6	30	10	4	0	0	1	0
73	0	30	100	170	20	0	0	3	0
74	0	0	0	0	0	0	0	0	0
75	0	3	55	180	12	0	0	3	3
76	0	3	20	35	2	0	0	0	0
77	1	6	20	16	2	0	0	0	0
78	0	1	30	24	5	0	0	0	0
79	0	2	30	57	11	0	0	0	0
80	0	1	7	15	2	0	0	13	0
81	0	5	35	28	2	0	0	6	0
82	0	1	4	5	0	0	0	0	0
83	0	1	10	3	1	0	0	0	0
84	0	2	32	15	1	0	0	0	0
85	0	3	63	70	4	0	0	0	0
86	0	0	36	70	4	0	0	6	0
87	0	0	12	35	3	0	0	3	0
88	0	5	70	25	0	0	0	0	0

ZONE	EXC	AAV	AVE	BA	POOR	GHU	TAXI	TRUCK	CA
89	0	4	38	8	0	0	0	1	0
90	0	3	45	20	2	0	0	8	7
91	0	5	50	50	5	0	0	2	0
92	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0
101	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0
107	0	0	0	0	0	0	0	0	0
108	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0
119	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0
124	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0
	34	310	4101	1864	351	0	0	616	162

APPENDIX H - FRICTION FACTORS

	TIME	HBW	HBO	NHB	E-I
GF	1 1	1300	500	400	400
GF	2 1	20900	25000	25000	5000
GF	3 1	25000	24800	19800	27500
GF	4 1	24800	25000	14600	22600
GF	5 1	24000	20800	9000	9300
GF	6 1	22400	14300	6200	9900
GF	7 1	39200	14500	5200	7500
GF	8 1	21600	10600	2900	8000
GF	9 1	20800	9500	1900	2400
GF	10 1	12700	8900	3300	2200
GF	11 1	11600	7900	3300	700
GF	12 1	5500	4100	500	500
GF	13 1	8400	4100	400	500
GF	14 1	7800	1700	300	250
GF	15 1	4500	500	200	350
GF	16 1	4200	300	100	120
GF	17 1	3400	200	100	200
GF	18 1	3900	100	100	100
GF	19 1	1400	100	100	100
GF	20 1	1100	100	100	100
GF	21 1	900	100	100	100
GF	22 1	600	100	100	100
GF	23 1	300	100	100	100
GF	24 1	200	100	100	100
GF	25 1	100	100	100	100
GF	26 1	100	100	100	100
GF	27 1	100	100	100	100
GF	28 1	100	100	100	100
GF	29 1	100	100	100	100
GF	30 1	100	100	100	100
GF	31 1	100	100	100	100
GF	32 1	100	100	100	100

APPENDIX I - CORDON STATION INFORMATION

The information on trip making characteristics was taken from the 1970 Origin and Destination Traffic Study for Clinton. Some through trip percentages, and some internal-external percentages had to be adjusted to match current conditions in the calibration phase. The following table shows the through trip percentages from the 1970 study, as well as those used for the current model.

EXTERNAL STATION	1970 %	1994 %
101 US 701	34.3	21.1
102 Pugh Road	7.1	7.3
103 Isaac Weeks Road	N/A	7.2
104 Gov. Moore Road	18.5	19.3
105 NC 403	22.6	23.0
106 Unnamed dirt road	N/A	0.0
107 Mathis Road	N/A	18.6
108 Old Warsaw Road	9.2	5.6
109 NC 24	37.3	37.0
110 Rowan Street	17.0	21.5
111 Reedsford Road	4.9	5.0
112 US 421	53.9	25.0
113 US 701	39.1	25.0
114 Beulah Road	N/A	7.0
115 Boykin Ridge Road	4.2	7.0
116 NC 24	27.3	27.0
117 North Boulevard	8.2	7.9
118 US 421	35.8	20.0
119 Brown's Church Road	N/A	10.1

(Note: Percentages lowered at 112 and 113 due to completion of I-40)

SUMMARY OF TRIPS AT CORDON STATIONS (BASE YEAR)

EXTERNAL STATION	THROUGH TRIPS	EXT-INT	TOTAL
101 US 701	1608	5892	7500
102 Pugh Road	44	556	600
103 Isaac Weeks Road	44	556	600
104 Gov. Moore Road	136	564	700
105 NC 403	1036	3464	4500
106 Unnamed dirt road	0	0	0
107 Mathis Road	94	406	500
108 Old Warsaw Road	102	1698	1800
109 NC 24	1800	5200	7000
110 Rowan Street	496	1804	2300
111 Reedsford Road	76	1424	1500
112 US 421	1550	4650	6200
113 US 701	1200	3600	4800
114 Beulah Road	64	836	900
115 Boykin Ridge Road	86	1114	1200
116 NC 24	2266	7734	10000
117 North Boulevard	158	1842	2000
118 US 421	1400	5600	7000
119 Brown's Church Road	152	1348	1500

FRATAR FACTORS USED TO CREATE 2020 THROUGH TRIP TABLE

EXTERNAL STATION	FACTOR
101 US 701	185
102 Pugh Road	167
103 Isaac Weeks Road	167
104 Gov. Moore Road	164
105 NC 403	184
106 Unnamed dirt road	100
107 Mathis Road	164
108 Old Warsaw Road	183
109 NC 24	183
110 Rowan Street	187
111 Reedsford Road	167
112 US 421	165
113 US 701	165
114 Beulah Road	167
115 Boykin Ridge Road	167
116 NC 24	185
117 North Boulevard	165
118 US 421	157
119 Brown's Church Road	167

THROUGH TRIP FREQUENCY

MINUTES	TRIPS	PERCENT
1	18	0.29
2	14	0.23
3	0	0.00
4	6	0.10
5	12	0.19
6	230	3.73
7	96	1.56
8	610	9.89
9	1520	24.64
10	2368	38.39
11	368	5.97
12	916	14.85
13	10	0.16